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AUTHOR Harris, Margaret L.; Harris, Chester W.
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ABSTRACT

Thirty-five tests which measure cognitive abilities at the intermediate grade level and the related manual are intended to accompany the authors' 1973 monograph, "A Structure of Concept Attainment Abilities." Additional tests which measure these abilities (verbal, induction, memory, spatial, numerical, perceptual speed, evaluation, word fluency, simple visualization, and seeing relationships) are also specified. Each of the cognitive ability factors and the development of the tests are described. A battery of these 35 tests, and the additional tests not included here, were administered to 790 boys and girls who had recently completed the fifth grade in the Madison, Wisconsin public schools. Scoring keys for the 35 tests, as well as information on test validity, reliability estimates, normative data, and item indices are also presented. (Author/GDC)

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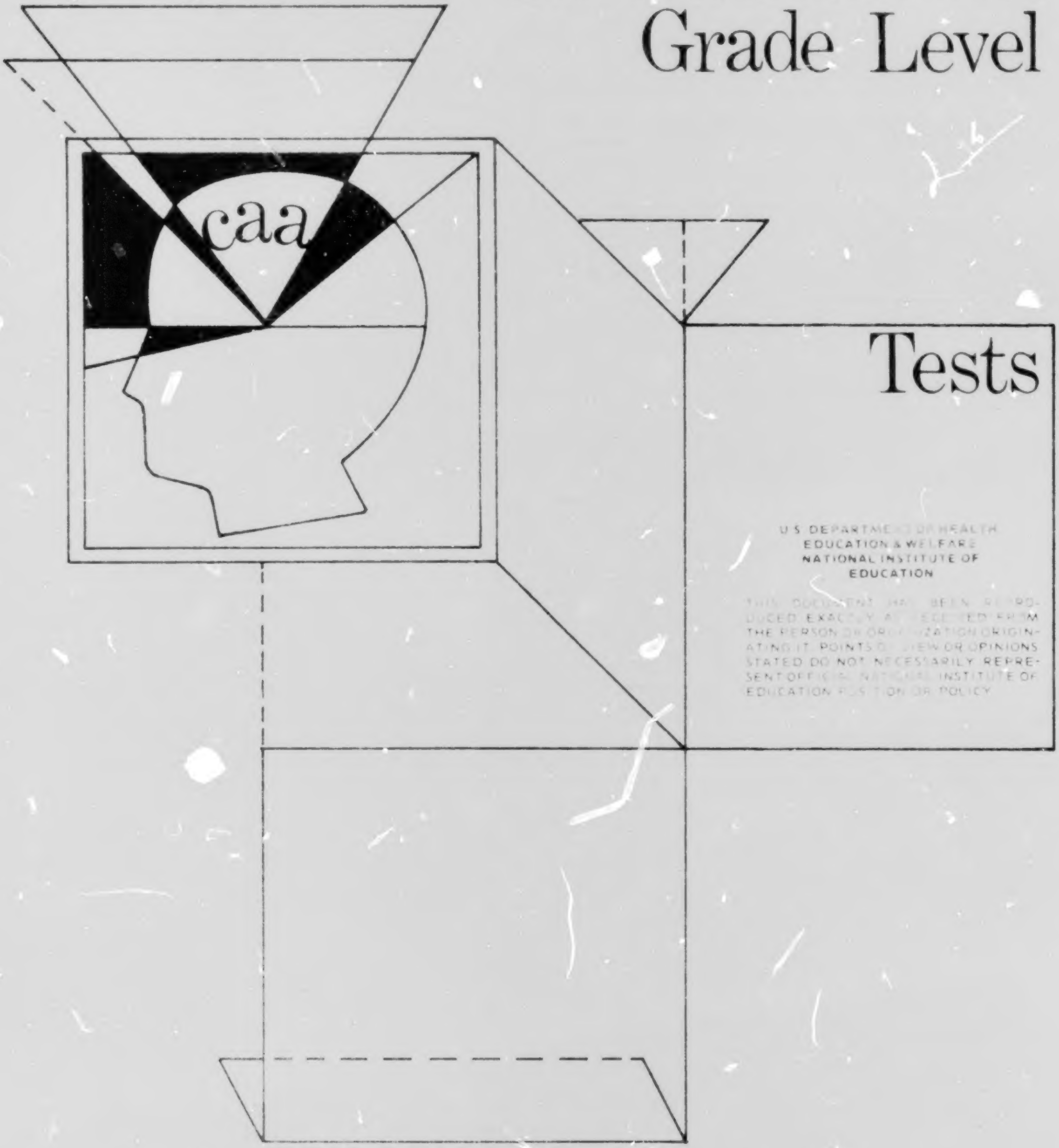
Instruments for Measuring Cognitive Abilities at the Intermediate Grade Level



Tests

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Instruments for Measuring Cognitive Abilities at the Intermediate Grade Level

Tests

Margaret L. Harris

Chester W. Harris
University of California, Santa Barbara

Wisconsin Research & Development Center
for Cognitive Learning

Madison, Wisconsin

LIST OF TESTS

Best Word Class
Circle Reasoning
Class Name Selection
Concealed Letters
Concealed Words
Disemvowelled Words
Gestalt Completion
Letter Classification
Letter Grouping
Letter Triangle
Number Class Extension
Number Classification
Number Exclusion
Number Relations
Number Series
Omelet
Picture Class Memory *
Picture Classification
Picture Exclusion
Picture Group Name Selection
Picture Group Naming
Remembering Classes: Members *
Remembering Classes: Names *
Remote Class Completion
Same-Opposite
Scrambled Sentences
Seeing Trends
Sensitivity to Order
Sentence Order
Verbal Analogies
Verbal Classification
Verbal Exclusion
Word Exclusion
Word Group Naming
Word Groups
Word Linkage
Word Relations

* A sheet of colored paper should be inserted after the study page in this test to avoid see-through by the student.

BEST WORD CLASS

DIRECTIONS

We often think of things as belonging to a class or being a kind of something. For example, we think of a chair as being a kind of furniture. In the questions that follow you will see a word in capitals on the left that can be called a kind of something. There are four possible answers listed on the right. Pick the best answer and mark its box on your answer sheet.

Here is an example:

I. OAK is a kind of

A. food
B. bird
C. car
D. tree

I. [A] [B] [C] ■ [E]

Which word is the best answer? OAK is a kind of tree. OAK is not a kind of food, bird or car. The D-box has been marked correctly above.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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BEST WORD CLASS

1. REED is a kind of

A. grass
B. book
C. bamboo
D. song

2. CORNHUSK is a kind of

A. plant
B. covering
C. grain
D. vegetable

3. ORGAN is a kind of

A. heart
B. muscle
C. musician
D. body part

4. RING is a kind of

A. bell
B. song
C. sound
D. gold

5. TORNADO is a kind of

A. wind
B. flood
C. rain
D. automobile

6. PEEL is a kind of

A. pod
B. sound
C. vegetable
D. fruit

7. BUCK is a kind of

A. male
B. antler
C. doe
D. meat

8. NEPHEW is a kind of

A. youngster
B. relative
C. baby
D. female

9. CROCODILE is a kind of

A. fish
B. snake
C. reptile
D. insect

10. SPIRE is a kind of

A. tunnel
B. castle
C. steeple
D. dungeon

GO ON TO THE NEXT PAGE

BEST WORD CLASS

11. ADOBE is a kind of

A. stucco
B. clay
C. stone
D. rock

12. LIGHT is a kind of

A. weight
B. energy
C. lamp
D. fire

13. SHALLOW is a kind of

A. depth
B. height
C. width
D. weight

14. RECESS is a kind of

A. report
B. vacation
C. possession
D. reservoir

15. COMPLIMENT is a kind of

A. praise
B. spice
C. service
D. wish

16. LIMERICK is a kind of

A. verse
B. cheese
C. lizard
D. wagon

17. OGRE is a kind of

A. genie
B. phantom
C. vegetable
D. monster

18. NYLON is a kind of

A. fiberglass
B. natural material
C. man-made material
D. cotton fiber

19. DREAM is a kind of

A. sleep
B. fairyland
C. nightmare
D. image

20. FOOD is a kind of

A. fat
B. flavor
C. starch
D. fuel

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

CIRCLE REASONING

DIRECTIONS

In each question there are 5 rows of circles and dashes. In each of the first 4 rows one circle is dark. These dark circles show you the "rule" for deciding which circle should be dark in the last row. You are to figure out the rule that fits the first 4 rows. Then use the rule to decide which circle should be dark in the last row. On your test booklet, put an X on the circle that should be dark.

Look at some examples below.

EXAMPLE I.
- ● - 0 0 - 0 (Row 1)
● 0 - 0 0 0 0 (Row 2)
- - - ● 0 0 - (Row 3)
- ● - 0 0 - 0 (Row 4)
- - 0 0 0 0 - Which circle should be dark?
1 2 3 4 5 6 7

Look carefully at the first example. Find out which circle is the dark one in every row. In each row the dark circle is always the very first circle on the left. This is called the "rule." Following this rule, which circle in the bottom row should be the dark one?

That's right. You should darken the first circle on the left. Then the last row would look like this:

- - ● 0 0 0 -
1 2 3 4 5 6 7

The number for this dark circle is 3, so 3 is the number of the correct answer. Here is a sample row of answer boxes that is marked correctly for this example. The 3-box has been filled in.

I. □ □ ■ □ □ □ □

Now turn the page and look at a second example.

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CIRCLE REASONING

Directions (continued):

```
EXAMPLE II. ● - - - 0 0 0
            - ● - 0 0 0 -
            0 0 0 0 0 - ●
            - 0 0 - ● - -
            0 0 - 0 - 0 0
            1 2 3 4 5 6 7
```

Look carefully. Can you find out which circle is the dark one in each row? This may look hard at first. The dark circle is not always the first circle in every row like the last problem. It also isn't always the last circle in the row, is it? If you look closely you will see that the dark circles are separated from all the other circles by dashes. In every row the dark circle is the only circle that is "alone." Following this rule, which circle in the bottom row should be dark? That's right. It is the circle above the number 4. The last row would look like this:

```
0 0 - ● - 0 0
1 2 3 4 5 6 7
```

The answer box for example II has been marked correctly here:

II. ☐ ☐ ☐ ■ ☐ ☐ ☐

EACH QUESTION IS DIFFERENT! You will have to look at each one carefully because there are many different kinds of rules. There are 20 questions. Answer all of them.

If you have any questions, ask them now.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

CIRCLE REASONING

Remember, only a circle can be the correct answer. A dash can never be.

1.
0 ● - - - 0 -
0 - ● - 0 - -
- - 0 - - ● 0
- - - 0 ● 0 -
0 0 - - - 0 -
1 2 3 4 5 6 7

2.
0 ● 0 - - 0 0
- 0 - 0 ● 0 -
0 - 0 ● 0 - 0
0 0 - - 0 ● 0
- 0 0 0 - - 0
1 2 3 4 5 6 7

3.
0 0 0 ● - 0 0
0 0 - 0 ● 0 0
0 - 0 - 0 - ●
0 0 - - - 0 ●
0 0 - 0 0 - 0
1 2 3 4 5 6 7

4.
● - 0 0 0 - -
0 0 - ● - - -
0 0 0 - - ● -
- - ● - - 0 0
0 0 - - 0 - -
1 2 3 4 5 6 7

5.
0 ● - 0 0 0 -
- 0 0 ● 0 - -
0 0 0 ● 0 - 0
- 0 0 0 0 - ●
0 0 0 - 0 0 0
1 2 3 4 5 6 7

6.
0 - ● 0 - - -
● 0 - - 0 0 0
- - - ● 0 - 0
- ● 0 - 0 0 0
0 - 0 - - 0 0
1 2 3 4 5 6 7

7.
0 0 0 - 0 0 ●
0 0 0 0 0 ● 0
- 0 0 0 0 0 ●
0 0 0 0 - 0 ●
0 0 0 0 0 0 -
1 2 3 4 5 6 7

8.
0 - 0 ● - - 0
0 0 0 - 0 ● -
- 0 - 0 ● - 0
0 0 0 0 - 0 ●
- 0 0 - 0 - 0
1 2 3 4 5 6 7

9.
- ● 0 0 0 0 0
0 0 - ● 0 0 -
- ● - - 0 0 0
0 0 0 0 0 - ●
0 0 0 - 0 0 0
1 2 3 4 5 6 7

10.
0 0 0 - 0 0 ●
0 - 0 0 ● 0 0
0 0 - 0 0 ● -
0 - 0 0 ● - 0
0 0 - 0 0 0 -
1 2 3 4 5 6 7

GO ON TO THE NEXT PAGE

CIRCLE REASONING

Remember, only a circle can be the correct answer. A dash can never be.

11.

-	0	-	0	●	0	-
0	●	0	-	-	0	0
-	0	●	0	-	-	-
-	0	0	-	0	●	0
-	0	-	0	0	0	-
1	2	3	4	5	6	7

12.

0	0	●	0	0	-	0
-	0	0	●	0	-	-
0	0	●	-	0	0	0
-	[illegible]	0	-	0	●	0
-	-	-	0	0	0	0
1	2	3	4	5	6	7

13.

●	0	-	-	0	0	0
-	-	●	0	-	-	0
0	-	0	-	●	0	-
0	-	●	0	-	-	0
0	0	0	-	0	0	-
1	2	3	4	5	6	7

14.

●	0	0	-	0	0	0
-	0	●	0	0	-	-
0	0	●	0	-	-	0
-	0	0	-	0	●	0
0	0	0	0	0	-	-
1	2	3	4	5	6	7

15.

-	0	0	-	●	0	0
-	0	-	●	0	0	0
0	0	0	0	-	-	●
0	0	0	-	0	-	●
0	0	-	0	0	-	0
1	2	3	4	5	6	7

16.

0	0	-	-	●	0	0
0	-	-	●	-	0	0
0	0	0	0	-	-	●
-	-	●	-	0	-	0
0	0	-	-	0	-	-
1	2	3	4	5	6	7

17.

0	-	0	0	-	0	●
0	-	-	0	●	0	0
0	0	0	-	-	0	●
0	-	0	-	0	●	0
0	0	-	0	-	0	0
1	2	3	4	5	6	7

18.

0	0	-	0	-	0	●
0	0	0	-	0	●	0
0	0	0	0	●	0	0
0	0	-	-	0	0	●
[illegible]	-	0	0	0	-	0
1	2	3	4	5	6	7

19.

0	0	0	-	0	●	-
0	●	-	-	-	0	-
0	-	0	●	-	-	0
0	●	-	0	0	0	0
0	-	-	0	0	-	0
1	2	3	4	5	6	7

20.

0	-	-	0	●	-	0
0	0	0	●	0	0	0
0	0	-	0	0	●	-
0	0	0	-	0	0	●
0	0	0	0	0	0	0
1	2	3	4	5	6	7

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

CLASS NAME SELECTION

DIRECTIONS

For each question there are four words on the left which are alike in some way. There are three possible answers on the right. One of them is a general name for the group of words on the left. Pick the best name for the group and mark its letter in the correct box on the answer sheet.

Here is an example question:

I.	poodle terrier hound collie	are all	A. cats B. dogs C. brown animals

I. ☐ ■ ☐ ☐ ☐

Poodle, terrier, hound and collie are all dogs. The best answer is "B." The B-box has been marked correctly above. They could all be brown animals but the best answer is dogs.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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CLASS NAME SELECTION

1. touch
smell
taste
hearing
are all
A. ways of feeling
B. senses of the body
C. parts of the body

2. water
electricity
steam
atomic energy
are all
A. power sources
B. liquids
C. gases

3. needle
antler
tack
fork
are all
A. pointed objects
B. metal things
C. tools

4. oil
food
gas
coal
are all
A. liquids
B. fuels
C. petroleum products

5. mink
beaver
raccoon
fox
are all
A. cave-dwelling animals
B. rare animals
C. fur-bearing animals

6. helmet
gas mask
shield
space suit
are all
A. head coverings
B. clothing
C. protectors

GO ON TO THE NEXT PAGE

CLASS NAME SELECTION

7. button are all A. fasteners
zipper
bolt B. decorations
clothespin

C. parts of clothing

8. gold are all A. jewelry
aluminum
iron B. metals
silver

C. money

9. sundial are all A. timepieces
clock
hourglass B. decorations
wristwatch

C. furniture

10. minute are all A. groups of days
year
century B. dates
hour

C. periods of time

11. warehouse are all A. buildings
brain
library B. storage places
cabinet

C. communication devices

12. den are all A. rooms
nest
hive B. furniture
cave

C. homes

GO ON TO THE NEXT PAGE

CLASS NAME SELECTION

13. subway
cave
well
pit
are all
A. openings in the ground
B. animal homes
C. means of travel

14. north
south
east
west
are all
A. directions
B. poles
C. climates

15. dictionary
encyclopedia
atlas
almanac
are all
A. biography books
B. story books
C. reference books

16. seat belt
stair rail
bumper
chain lock
are all
A. fastening devices
B. mechanical devices
C. safety devices

17. peppermint
lemon
vanilla
orange
are all
A. spices
B. flavors
C. colors

18. pretty
cold
blue
long
are all
A. adjectives
B. nouns
C. feelings

GO ON TO THE NEXT PAGE

CLASS NAME SELECTION

19. brick
ranch
frame
stone
are all
A. construction tools
B. houses
C. offices

20. lake
well
pond
ocean
are all
A. places where fish live
B. man-made bodies of water
C. sources of drinking water

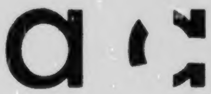
STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

CONCEALED LETTERS

DIRECTIONS

This is a test to see how well you can tell what letters are after parts of the letter have been erased. Look at the letters printed below. The letter a has been completely printed the first time; the second time parts of the letter have been erased.



Now look at the second letter above once more. If you saw only this letter, you might think it could be part of the letters d, g, or q. But you would need to add more letter parts to make these letters than you would need to make the letter a. The letter a is correct because it is the simplest letter which can be made.

Now look at the letter below. Parts of the letter have been erased. Try to figure out which letter is the simplest one that can be made from these parts. Print you answer on the line beside the printed letter.

____

You should have written u. You might think it could be part of the letters a, d, g, or q. But you would need to add more letter parts to make these letters than you would need to make the letter u.

No letters in this test will be capitalized. There are 40 letters in this test. Remember to write the simplest letter that can be made from the parts. Be sure to answer every question. Print your answers neatly so you will get credit for them.

If you have any questions, ask them now.

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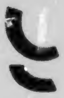
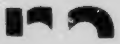
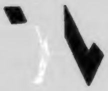
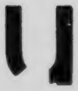
CONCEALED LETTERS

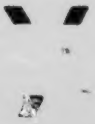
Write the simplest letter that can be made from these letter parts.

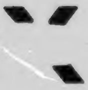
1.  ________

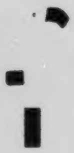
2.  ________

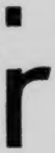
3.  ________

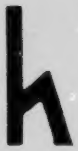
4.  ________

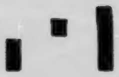
5.  ________

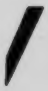
6.  ________

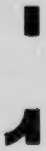
7.  ________

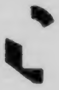
8.  ________

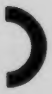
9.  ________

10.  ________

11.  ________

12.  ________

13.  ________

14.  ________

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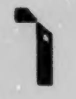
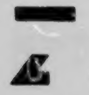
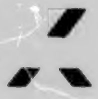
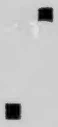
CONCEALED LETTERS

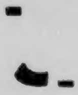
Write the simplest letter that can be made from these letter parts.

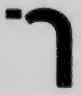
15.  ____________

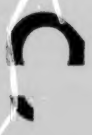
16.  ____________

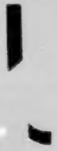
17.  ____________

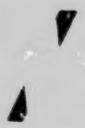
18.  ____________

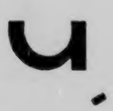
19.  ____________

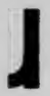
20.  ____________

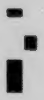
21.  ____________

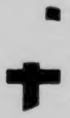
22.  ____________

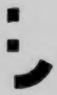
23.  ____________

24.  ____________

25.  ____________

26.  ____________

27.  ____________

28.  ____________

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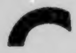
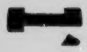
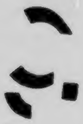
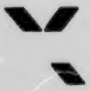
CONCEALED LETTERS

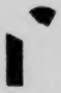
Write the simplest letter that can be made from these letter parts.

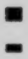
29.  __________

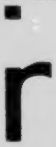
30.  __________

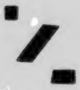
31.  __________

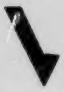
32.  __________

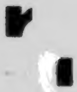
33.  __________

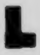
34.  __________

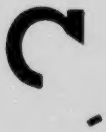
35.  __________

36.  __________

37.  __________

38.  __________

39.  __________

40.  __________

STOP

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CONCEALED WORDS

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DISEMVOWELLED WORDS

DIRECTIONS

This test is made up of 15 words. All the vowels are missing in these words. You are to make each word complete by choosing the correct vowel for each blank space. Each space for a missing vowel has a different number. The answer choices for each blank space are the vowels A, E, I, O, and U. Look at the KEY below to see what box number within a row has been assigned to each vowel. Below are two examples of words with missing vowels and the correct way to mark the answers.

KEY

If the missing vowel is A, mark box number 1
If the missing vowel is E, mark box number 2
If the missing vowel is I, mark box number 3
If the missing vowel is O, mark box number 4
If the missing vowel is U, mark box number 5

Example A: $G\ \underset{1}{\underline{\ \ }}$

Example B: $Y\ \underset{2}{\underline{\ \ }}\ S\ T\ \underset{3}{\underline{\ \ }}\ R\ D\ \underset{4}{\underline{\ \ }}\ Y$

1. ☐ ☐ ☐ ■ ☐ ▨ ▨
2. ☐ ■ ☐ ☐ ☐ ▨ ▨
3. ☐ ■ ☐ ☐ ☐ ▨ ▨
4. ■ ☐ ☐ ☐ ☐ ▨ ▨

For Example A the word is GO. (GA, GE, GI, GU are not words.) From the KEY you see that O is answer box number 4. The blank space where the O should be is numbered 1. Look at the row of boxes numbered 1. The fourth box has been marked correctly for the O that belongs in the missing space. The word for Example B is YESTERDAY. There are three missing vowels with spaces numbered 2, 3, and 4. The vowel for space 2 is E, and it has been marked correctly in the row of boxes numbered 2. The vowel for space 3 is E, and it has been marked correctly in the row of boxes numbered 3. The vowel for space 4 is A, and it has been marked correctly in the row of boxes numbered 4.

There are 15 words on the test, but there are 32 blank spaces. You will use 32 answer rows on the answer sheet. Notice that the word YESTERDAY in the example above has 3 blank spaces where a vowel belongs. Each space has a different number and uses a different row of answer boxes. This will be true of the words on the test. Each blank space, not each word, is a separate question.

Decide on the correct vowels for each word. On the answer sheet find the row of boxes numbered the same as the blank space. Use the KEY to see what box number within a row to fill in for the missing vowel. Answer all 32 questions.

If there are any questions, ask them now.

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DISEMVOWELLED WORDS

If the missing vowel is A, mark box number 1
If the missing vowel is E, mark box number 2
If the missing vowel is I, mark box number 3
If the missing vowel is O, mark box number 4
If the missing vowel is U, mark box number 5

S _ D D L _
1 2

C _ N _ _
3 4 5

C _ N D L _
6 7

P R _ S _ N
8 9

S P L _ N T _ R
10 11

C H _ P T _ R
12 13

B R _ _ N
14 15

Y _ N D _ R
16 17

H _ N _ S T
18 19

_ L B _ W
20 21

T H R _ _ D
22 23

K _ N G D _ M
24 25

M _ S C L _
26 27

B _ N D _ G _
28 29 30

P _ _ N C E
31 32

STOP

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GESTALT COMPLETION

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LETTER CLASSIFICATION

DIRECTIONS

Each question has three (3) groups of letters in the left column that belong together. They form a class based upon structure or form of the letters. There are three (3) groups of letters on the right that are possible answers. You are to pick the one answer that belongs with the three groups of letters on the left. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. You are to fill in the answer box on the answer sheet that has the same number as the answer you picked.

Here is an example:

I.	AAA	1. ABC	
	CCC	2. DDD	I. ☐ ■ ☐ ☐ ☐ ☐ ☐
	BBB	3. AAB	

How are the three groups of letters on the left alike? They all have three letters that are the same. Which one letter group on the right is like them? 2. DDD has all three letters that are the same. 1. ABC has three different letters and 3. AAB has only two letters that are the same and one that is different. The correct answer is 2. The 2 - box has been marked correctly above.

There are 20 questions. Answer all of them. Remember there are many different ways the letter groups are alike.

If you have any questions, ask them now.

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LETTER CLASSIFICATION

Which group of letters on the right belongs with the groups on the left?

1.	AAB	1.	ACC
	AAC	2.	BBC
	BBA	3.	CBC
2.	ABA	1.	CAC
	BAB	2.	DDC
	DBD	3.	CBB
3.	AAD	1.	ABD
	ABA	2.	BAB
	AAC	3.	ACA
4.	CBA	1.	ACB
	BCA	2.	ABA
	ABC	3.	CCB
5.	CAC	1.	CAA
	BCC	2.	CCA
	CBC	3.	BCB
6.	ABCC	1.	BABC
	CDAA	2.	ADBB
	BDAA	3.	AACB
7.	ABEA	1.	ADBC
	ACAB	2.	ABCB
	EBAA	3.	AACB
8.	ACBD	1.	DCAB
	CABD	2.	ACBA
	BCDA	3.	CBBD
9.	AABC	1.	BADA
	BBCA	2.	AACD
	BBDA	3.	ACBB
10.	BADA	1.	DCBC
	ABCB	2.	ACAB
	CDBD	3.	BBAD
11.	DAAA	1.	CBCC
	ABBB	2.	BBBA
	BCCC	3.	CDDD
12.	AABB	1.	DDCC
	CCDD	2.	ACCA
	BBDD	3.	BDBD
13.	BABC	1.	CADA
	ABAD	2.	BABD
	CBCA	3.	ABCC
14.	CCBC	1.	DDBD
	AABA	2.	EEAE
	EEB[illegible]	3.	AABC
15.	ABBA	1.	BBCC
	CDDC	2.	AABB
	BCCB	3.	ADDA
16.	ACAA	1.	ADDA
	BCBB	2.	ABAA
	BDBB	3.	AABA
17.	BADB	1.	BCDE
	DEBD	2.	DCDB
	CADC	3.	ABCA
18.	BDBE	1.	BBAE
	CABB	2.	ABAD
	EBCB	3.	CCDB
19.	ABBC	1.	ABDA
	CDDB	2.	CAAC
	DAAB	3.	ACCB
20.	BBCB	1.	BBAB
	ACAA	2.	DADD
	CDDD	3.	EEEC

STOP

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LETTER GROUPING

DIRECTIONS

For each question there are 4 groups of letters. Three (3) of these groups follow the same pattern. The pattern is based on the arrangement of the letters. One group of letters does not follow this pattern. You are to decide which group does not belong. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. Fill in the box that has the same number as the group you picked.

There are several different types of patterns. Here is one example:

I. 1. AAA 2. BBB 3. CCC 4. ABC I. ☐ ☐ ☐ ■ ☐ ☐ ☐

Which group of letters does not follow the pattern? Every group except "4" has three letters that are the same. Group 4 does not belong. The 4-box is marked correctly above.

There are 20 questions. Answer all of them. Remember there are many different kinds of patterns to find.

If you have any questions, ask them now.

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LETTER GROUPING

Which one letter group does not belong with the other three?

1.	1. AAB	2. ACC	3. AAC	4. BBA
2.	1. ABA	2. BAB	3. CCB	4. CBC
3.	1. ABA	2. CBA	3. BCA	4. ABC
4.	1. AAD	2. ABA	3. AAC	4. ABD
5.	1. CAC	2. ABC	3. BCC	4. CCA
6.	1. BABC	2. ABCC	3. CDAA	4. BDAA
7.	1. ABEA	2. ADBC	3. ACAB	4. AAEB
8.	1. ACBD	2. CABD	3. ACBA	4. ACDB
9.	1. BADA	2. AABC	3. BBCA	4. BBDA
10.	1. BADA	2. ABCB	3. ABDB	4. ACAB
11.	1. DAAA	2. ABBB	3. CBCC	4. BCCC
12.	1. AC[illegible]A	2. AABB	3. CCDD	4. BBDD
13.	1. BABC	2. CADA	3. BABD	4. ABAD
14.	1. CCBC	2. AABA	3. DDBD	4. EEAE
15.	1. ABBA	2. CDDC	3. BBCC	4. ADDA
16.	1. ACAA	2. ADDA	3. BCBB	4. BDBB

GO ON TO THE NEXT PAGE

LETTER GROUPING

Which one letter group does not belong with the other three?

17. 1. BADB 2. BCDE 3. DEBD 4. CADC

18. 1. BDBE 2. CABB 3. EBCB 4. ABAD

19. 1. ABBC 2. ABDA 3. CDDB 4. DAAB

20. 1. EEEA 2. BBCB 3. ACAA 4. CDDD

STOP

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LETTER TRIANGLE

DIRECTIONS

Each question is like a triangle of letters. The alphabetical order of the letters forms some kind of a pattern. One letter is missing from this pattern. You are to figure out the pattern and decide what letter is missing. There are three letters given on the right. These are the possible answers for that question. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. Fill in the answer box that has the same number as the answer you picked.

There are several patterns of letter triangles in the test. Here are two examples:

Example I. A

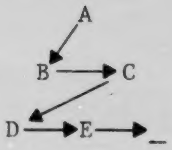
B C

D E _

1. F
2. G
3. J

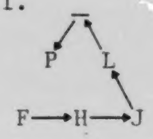
I. ■ ☐ ☐ ☐ ☐ ☐ ☐

What are the letters used in this triangle? How are they arranged?



A, B, C, D, and E immediately follow each other in the alphabet. The arrows show the direction of this pattern. The blank space follows the letter E. F follows E in the alphabet. F is the answer. Its number is 1 in the list of possible answers. The 1-box has been marked correctly above.

Example II.



1. O
2. N
3. M

II. ☐ ■ ☐ ☐ ☐ ☐ ☐

The arrows show the direction of this pattern. It begins with F and the next letter is H. So one letter has been skipped. This is true for the rest of the letters included. Just every other letter is used. The 2-box has been marked for the correct answer which is N.

There are 20 triangles. Answer all of them. Remember there are many different patterns. The letters in each question form one pattern.

If you have any questions, ask them now.

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LETTER TRIANGLE

What is the missing letter?

1.

Q
M _
L N O

1. P
2. R
3. K

2.

Q
S R
V U _

1. W
2. T
3. V

3.

N
Q O
S _ P

1. L
2. T
3. R

4.

K
O L
P N _

1. J
2. Q
3. M

5.

C
D _
E F A

1. B
2. H
3. G

GO ON TO THE NEXT PAGE

LETTER TRIANGLE

What is the missing letter?

6.

_
F H
G I J

1. I
2. D
3. E

7.

X
W V
U _ S

1. Y
2. R
3. T

8.

K
M L
P _ N

1. Q
2. O
3. J

9.

K
_ E
G C A

1. I
2. J
3. H

10.

M
K _
J I H

1. G
2. L
3. N

GO ON TO THE NEXT PAGE

LETTER TRIANGLE

What is the missing letter?

11.

E

I F

_ H G

1. J
2. K
3. D

12.

U

V W

Z _ X

1. Y
2. U
3. T

13.

K

E _

A C G

1. J
2. I
3. D

14.

L

_ K

N O P

1. J
2. Q
3. M

15.

N

H L

_ F J

1. K
2. E
3. D

GO ON TO THE NEXT PAGE

LETTER TRIANGLE

What is the missing letter?

16.

G

M _

V S P

1. J
2. K
3. Y

17.

H

F J

_ N L

1. D
2. E
3. O

18.

_

S T

P Q R

1. O
2. V
3. U

19.

K

J G

_ H F

1. D
2. E
3. I

20.

P

M J

A D _

1. F
2. G
3. L

STOP

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NUMBER CLASS EXTENSION

DIRECTIONS

For each question there is a set of 4 numbers. The numbers in the set are related in some way. Beside the set of numbers are three answer choices. Find the relationship between the set of numbers and then pick the one answer choice that is related in the same way to the set of four numbers. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. You are to fill in the answer box on the answer sheet that has the same letter as the answer you picked.

Here are two examples:

Example I.	3	A.	6
	9	B.	2
	12	C.	13
	21		

Look at the 4 numbers on the left. How are these numbers related? Each number is divisible by 3. Now, which choice (on the right) is divisible by 3? 6 is the correct answer. Its letter is A. The A-box below has been marked correctly:

I. ■ ☐ ☐ ☐ ☐

Example II.	2	A.	9
	5	B.	8
	11	C.	7
	3		

Look at the 4 numbers on the left. How are these numbers related? Each number is a prime number (it is divisible only by itself and 1). Which choice is a prime number? 7 is the correct answer. Its letter is C. The C-box has been marked correctly:

II. ☐ ☐ ■ ☐ ☐

Look at each question carefully. There are lots of different ways that the numbers can be related.

There are 20 questions on this test. Answer all of them.

If you have any questions, ask them now.

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NUMBER CLASS EXTENSION

Which number on the right belongs with the four numbers on the left?

1. 20 A. 45
40 B. 24
25 C. 16
10

2. 1 A. 6
5 B. 9
2 C. 3
11

3. 1/4 A. 1/3
1/10 B. 1/11
1/12 C. 1/6
1/8

4. 3 A. 9
19 B. 23
5 C. 21
17

5. 9 A. 12
21 B. 13
6 C. 14
18

6. 16 A. 25
50 B. 22
38 C. 43
4

7. 1/4 A. 1/12
1/8 B. 1/10
1/16 C. 1/6
1/20

8. 21 A. 38
81 B. 12
51 C. 33
11

9. 31 A. 22
17 B. 4
3 C. 2
7

10. 21 A. 18
42 B. 28
14 C. 36
63

11. 1/20 A. 1/5
1/15 B. 2/5
1/50 C. 1/2
1/10

12. 14 A. 49
26 B. 35
20 C. 32
56

GO ON TO THE NEXT PAGE

NUMBER CLASS EXTENSION

Which number on the right belongs with the four numbers on the left?

13. 29 A. 32
37 B. 33
35 C. 34
31

14. 2 A. 26
29 B. 18
7 C. 23
13

15. 28 A. 18
6 B. 23
42 C. 35
20

16. 19 A. 14
23 B. 2
37 C. 26
11

17. 23 A. 13
45 B. 32
67 C. 54
89

18. 11 A. 9
2 B. 15
5 C. 19
7

19. 48 A. 15
24 B. 18
6 C. 38
30

20. 13 A. 9
11 B. 5
17 C. 21
3

STOP

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NUMBER CLASSIFICATION

DIRECTIONS

There are three (3) numbers in a row on the left for each question. For each group of three questions, there are five (5) possible answers on the right. The three numbers in a row on the left are alike in some way, based on structure or form. The way the numbers are alike has nothing to do with the value of the numbers. Decide how the three numbers are alike. Then choose one (1) number from the five on the right that is like the other three. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. Fill in the answer box on the answer sheet that has the same letter as the answer you picked.

Here is an example of a group of three questions:

I.	21	24	27
II.	79	89	19
III.	22	33	55

A. 39
B. 44
C. 12
D. 92
E. 23

I. [A] [B] [C] [D] ■
II. ■ [B] [C] [D] [E]
III. [A] ■ [C] [D] [E]

How are the three numbers of question I alike? The numbers 21, 24, and 27 all start with a 2. Which number on the right begins with a 2? The number 23 goes with the numbers on line I. Its letter is E. The E-box for question I is marked correctly above. How are the numbers in question II alike? They all end with 9. Which number on the right ends with 9? The correct answer is 39. Its letter is A. The A-box for question II is marked correctly above. How are the three numbers of question III alike? They are all double digits. Which number on the right is made up of two of the same digits? The correct answer is 44. Its letter is B. The B-box for question III is marked correctly above.

There are 10 groups of 3 questions. Answer all of them. You will use 30 rows of answer boxes.

If you have any questions, ask them now.

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NUMBER CLASSIFICATION

Which number on the right goes with each set of three numbers on the left?

1. 12383 47383 23383
2. 27850 27343 27011
3. 14057 64559 24358

A. 27626
B. 20753
C. 94353
D. 24583
E. 69383

4. 8861 4288 1880
5. 3594 4935 3945
6. 2221 7333 6660

A. 4395
B. 9666
C. 8948
D. 4885
E. 4391

7. 280 247 263
8. 171 481 691
9. 728 798 748

A. 301
B. 128
C. 738
D. 782
E. 224

10. 78 79 76
11. 42 22 32
12. 31 73 43

A. 52
B. 28
C. 74
D. 87
E. 36

13. 6 695 643
14. 5 75 885
15. 21 2 629

A. 115
B. 82
C. 750
D. 16
E. 67

GO ON TO THE NEXT PAGE

NUMBER CLASSIFICATION

Which number on the right goes with each set of three numbers on the left?

16. 2139 27396 2939

17. 26784 57784 1784

18. 1560 15602 15607

A. 3784
B. 15603
C. 15063
D. 24390
E. 20324

19. 6943 826 8861

20. 5132 235 5632

21. 289 109 48769

A. 3201
B. 30521
C. 2049
D. 293
E. 40601

22. 89 4689 17289

23. 17 173 17349

24. 234 2067 27

A. 224
B. 1761
C. 187
D. 389
E. 12890

25. 1734 69341 20347

26. 16978 55578 14478

27. 2970 49323 1954

A. 1534
B. 3491
C. 2678
D. 7348
E. 69733

28. 324 38974 314

29. 318 41872 618

30. 256 89756 156

A. 34886
B. 91840
C. 31056
D. 41054
E. 36544

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

NUMBER EXCLUSION

DIRECTIONS

There are four (4) numbers for each question. Three (3) of these numbers belong together. They form a class based upon the structure or form of the numbers. The value of the numbers is not important. One number does not belong to this class. You are to pick the number that does not belong. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. You are to fill in the answer box on the answer sheet that has the same letter as the answer you picked.

Here is an example:

I. A. 22 B. 33 C. 26 D. 55

I. A B ■ D E

Three of these belong to a class. Which number does not belong? A. 22, B. 33, and D. 55 are all two of the same digits. C. 26 is not. Its letter is C. The C-box is marked correctly above.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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NUMBER EXCLUSION

Which number does not belong?

1. A. 42 B. 28 C. 32 D. 52

2. A. 666 B. 999 C. 777 D. 969

3. A. 413 B. 393 C. 23 D. 63

4. A. 5 B. 75 C. 750 D. 885

5. A. 384 B. 343 C. 34 D. 3401

6. A. 8091 B. 6041 C. 4101 D. 5011

7. A. 2194 B. 2942 C. 2138 D. 2162

8. A. 14257 B. 94583 C. 64159 D. 24358

9. A. 8861 B. 4288 C. 8948 D. 1880

10. A. 16 B. 6 C. 695 D. 643

11. A. 79364 B. 73 C. 5356 D. 5954

12. A. 41374 B. 43645 C. 4694 D. 48724

13. A. 20324 B. 2139 C. 2939 D. 27396

14. A. 15602 B. 15063 C. 1560 D. 156204

15. A. 21111 B. 11134 C. 20111 D. 71114

GO ON TO THE NEXT PAGE

NUMBER EXCLUSION

Which number does not belong?

16. A. 318 B. 41872 C. 9184 D. 9813

17. A. 877 B. 566 C. 433 D. 212

18. A. 2970 B. 679 C. 49323 D. 193

19. A. 1734 B. 69341 C. 3491 D. 10347

20. A. 256 B. 89756 C. 3056 D. 35608

STOP

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NUMBER RELATIONS

DIRECTIONS

For each question there are four (4) pairs of numbers. Three (3) of the pairs are alike in some way according to the value of the numbers. One pair is different. You are to decide which pair does not belong with the other three. On the answer sheet, find the row of answer boxes that has the same number as the question you are working on. Fill in the answer box that has the same letter as the answer you picked.

In the test there are several ways in which the pairs of numbers may be alike. Here is one example:

I. A. 3, 4
B. 1, 2
C. 4, 6
D. 2, 3

I. ☐ ☐ ■ ☐ ☐

Look at the pairs of numbers. How are three of them alike?

A. 3, 4 $3 + 1 = 4$
B. 1, 2 $1 + 1 = 2$
C. 4, 6 $4 + 1 = 5$, but the second number in C. is 6.
D. 2, 3 $2 + 1 = 3$

Pairs A, B, and D are alike. Adding the number 1 to the first number of the pairs gives the second number of that pair. C. is different. The C-box above has been marked correctly.

Now look at another example question.

II. A. 3, 9
B. 5, 10
C. 6, 12
D. 2, 4

II. ■ ☐ ☐ ☐ ☐

Which number pair does not belong? A is the correct answer. In B, C, and D the first number is multiplied by 2 to get the second number. The A-box has been marked correctly above.

There are 20 questions. Answer all of them. Remember there are several ways the pairs of numbers may be alike.

If there are any questions, ask them now.

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NUMBER RELATIONS

In each group, which number pair does not belong?

1. A. 7, 2
B. 10, 4
C. 13, 7
D. 8, 2

2. A. 5, 7
B. 1, 2
C. 3, 5
D. 4, 6

3. A. 20, 4
B. 10, 2
C. 15, 3
D. 5, 5

4. A. 2, 6
B. 5, 8
C. 1, 5
D. 3, 7

5. A. 6, 18
B. 3, 9
C. 2, 5
D. 5, 15

6. A. 9, 4
B. 6, 1
C. 8, 2
D. 10, 5

7. A. 3, 6
B. 2, 10
C. 4, 8
D. 5, 10

8. A. 12, 18
B. 3, 9
C. 11, 16
D. 1, 7

9. A. 4, 1
B. 9, 4
C. 7, 4
D. 8, 5

10. A. 16, 4
B. 4, 1
C. 8, 2
D. 5, 1

GO ON TO THE NEXT PAGE

NUMBER RELATIONS

In each group, which number pair does not belong?

11. A. 10, 2
B. 8, 1
C. 12, 5
D. 11, 4

12. A. 9, 3
B. 6, 1
C. 12, 2
D. 24, 4

13. A. 5, 36
B. 2, 14
C. 4, 28
D. 3, 21

14. A. 21, 3
B. 7, 1
C. 9, 3
D. 14, 2

15. A. 9, 10
B. 6, 8
C. 4, 5
D. 2, 3

16. A. 4, 20
B. 2, 8
C. 3, 12
D. 6, 24

17. A. 15, 5
B. 6, 2
C. 9, 3
D. 10, 4

18. A. 12, 9
B. 4, 1
C. 7, 3
D. 8, 5

19. A. 11, 21
B. 8, 16
C. 3, 6
D. 7, 14

20. A. 2, 8
B. 1, 3
C. 3, 9
D. 2, 6

STOP

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NUMBER SERIES

DIRECTIONS

In each question in this test there is a series of numbers given in a certain order. You are to discover the order (or way) in which the series of numbers is arranged and then find the number at the right which should come next.

Look at the first example.

EXAMPLE I. 7 8 9 10 ____
A. 7
B. 8
C. 10
D. 11
E. 12

In this series of numbers (7, 8, 9, 10) each number is 1 more than the number before it. The next number after 10 should be 11. The letter in front of 11 is D. The **D-box** has been marked correctly.

I. A B C ■ E

Here is another example. Which number should come next?

EXAMPLE II. 8 8 7 7 6 6 ___
A. 4
B. 5
C. 6
D. 7
E. 8

The next number should be 5. Its letter is B, so the B-box below has been marked correctly.

II. A ■ C D E

Look at each question carefully. There are many different orders of numbers. Choose the best answer for each question. There are 20 questions. Be sure to answer all of them.

If you have any questions, ask them now.

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NUMBER SERIES

Choose the best answer to fill in the blank.

1. 10 8 6 4 ____

A. 5
B. 4
C. 3
D. 2
E. 1

2. 20 5 21 5 ____

A. 5
B. 15
C. 22
D. 25
E. 26

3. 2 6 9 11 15 18 20 ____

A. 22
B. 23
C. 24
D. 25
E. 26

4. 15 26 37 48 ____

A. 12
B. 23
C. 51
D. 59
E. 68

5. 7 21 10 30 13 39 ____

A. 16
B. 19
C. 48
D. 92
E. 108

6. 20 22 17 19 14 16 11 ____

A. 15
B. 13
C. 12
D. 9
E. 6

7. 782 682 582 482 ____

A. 382
B. 438
C. 542
D. 658
E. 682

GO ON TO THE NEXT PAGE

NUMBER SERIES

Choose the best answer to fill in the blank.

8. 2 8 14 20 ____

A. 16
B. 20
C. 22
D. 24
E. 26

9. 1 12 123 ____

A. 12
B. 123
C. 1234
D. 234
E. 4

10. 917 825 937 845 ____

A. 825
B. 856
C. 938
D. 947
E. 957

11. 10 12 15 19 21 24 ____

A. 26
B. 27
C. 28
D. 29
E. 30

12. 84 114 144 174 204 ____

A. 124
B. 234
C. 384
D. 404
E. 814

13. 4 1 6 3 8 5 ____

A. 7
B. 9
C. 10
D. 11
E. 12

14. 33 44 55 66 ____

A. 67
B. 76
C. 77
D. 88
E. 99

GO ON TO THE NEXT PAGE

NUMBER SERIES

Choose the best answer to fill in the blank.

15. 4 6 3 6 ____

A. 1
B. 2
C. 3
D. 5
E. 6

16. 1 1 3 2 2 4 3 3 ____

A. 1
B. 2
C. 4
D. 5
E. 6

17. 30 25 21 18 ____

A. 28
B. 23
C. 20
D. 17
E. 16

18. 19 28 37 46 ____

A. 51
B. 52
C. 53
D. 54
E. 55

19. 501 642 503 644 ____

A. 505
B. 541
C. 604
D. 646
E. 705

20. 2 3 5 8 ____

A. 8
B. 9
C. 10
D. 11
E. 12

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

OMELET

DIRECTIONS

The order of the letters in each group can be changed to make a word. You are to change the order of the letters to make a word. Use each letter in the group. Print the word that you make in the space provided.

Here is an example: orf ______________

What word can you make out of all the letters o,r,f? The only word that can be made is for. Print for on the line beside the letters.

There are 20 groups of letters. Change each group to a word.

Remember:

1. Print neatly
2. Put the word you make on the line provided

If you have any questions, ask them now.

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OMELET

Change the order of the letters to form a word. Write the word in the blank space.

1. karc ____________
2. tgfi ____________
3. ilob ____________
4. ngki ____________
5. klim ____________
6. lguy ____________
7. oonni ____________
8. kkuns ____________
9. txrea ____________
10. slasc ____________
11. kils ____________
12. niser ____________
13. hicr ____________
14. noev ____________
15. cieuj ____________
16. erega ____________
17. tearf ____________
18. roamy ____________
19. skam ____________
20. srifk ____________

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

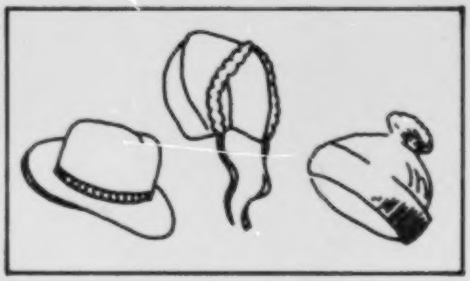
PICTURE CLASS MEMORY

DIRECTIONS

For this test you will have 1½ minutes to study a page of pictures. After studying the page of pictures for 1½ minutes you will be asked to remember the kinds of pictures that you studied. On the study page there are 10 sets of pictures, with each set in a box. The three pictures in the set show objects that are alike in some way; these objects all belong to the same class.

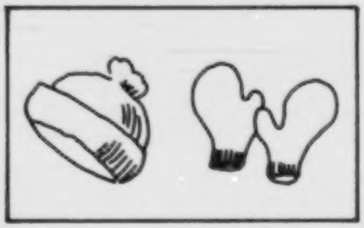
Look at this study example. It is a set of three pictures. The pictures are of a hat, a bonnet, and a cap. They are alike, since each is something that people wear on their heads. This is the "class."

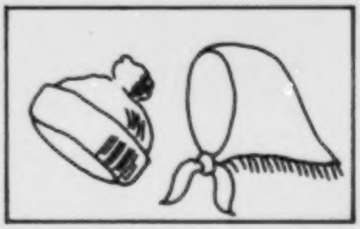
Study Example:



Your first task is to decide what class the group of three pictures belongs to. Then you will need to remember that class. You will not be able to look back when answering the questions about them.

Now look at these two test examples. They consist of two sets of two pictures each. The cap appears in both sets. In one set there is a pair of mittens pictured with a cap. You should decide whether or not





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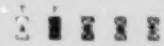
PICTURE CLASS MEMORY

Directions (continued):

these two pictures belong to the class that you studied. Do they? No. They are not both something that people wear on their heads. Cap and mittens are clothes that people wear for warmth. That is not the same as things people wear on their heads. The answer for the box with the cap and mittens is "no." The row of answer boxes for this question would look like this:

I. 

The F is for false, or "NO," answers.

Now look at the box with the cap and the scarf. What class of objects does this picture show? Is this the same class of objects as cap-hat-bonnet? Cap and scarf are things people wear on their heads. That is the same class as the cap, hat, and bonnet. Therefore, the answer for the box with the cap and scarf is "yes." The row of answer boxes for that question would look like this:

II.

The T is for true, or "YES," and has been marked correctly.

On the study page you will see 10 sets of pictures. Look at these and study them very carefully so that you can remember the classes you have seen.

After 1½ minutes I will tell you to turn the page, and you will find 2 test pages of 20 sets of pictures with 2 pictures in a set. Look at each set of 2 pictures and try to remember if it shows the same class as one that you saw on the study page. The answer for any set of pictures could be yes or no. If you think the class is the same as the one you remember, mark the T-box. If it is not the same, mark the F-box.

T means YES

F means NO

You will do this for all 20 of the questions.

You must remember the ten classes from the 1½ minutes of study time you will have. Once you turn the study page you cannot look back at it.

If you have any questions, ask them now.

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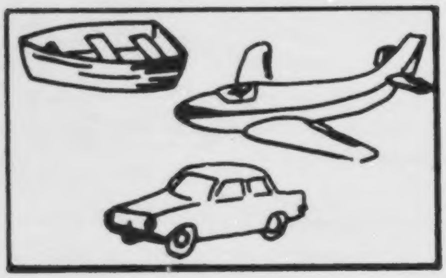
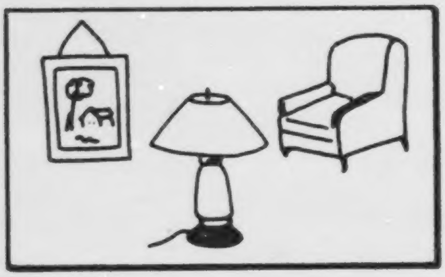
PICTURE CLASS MEMORY

Study Page

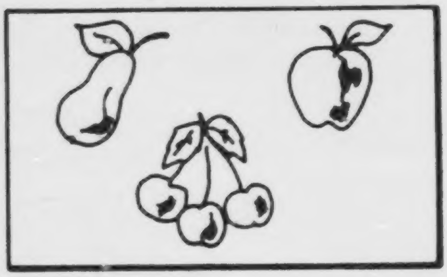
A.



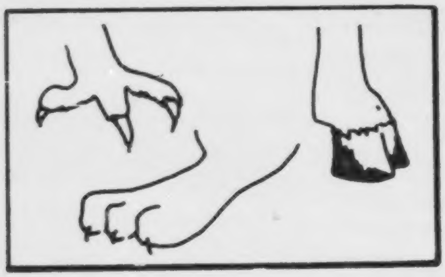
B.



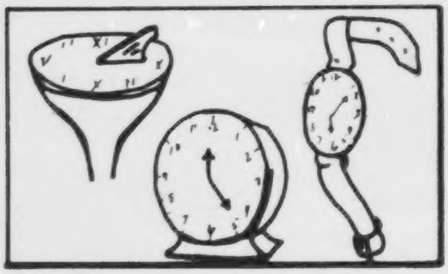
C.



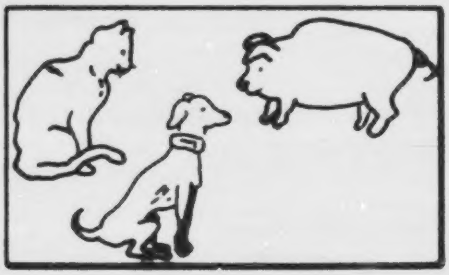
D.



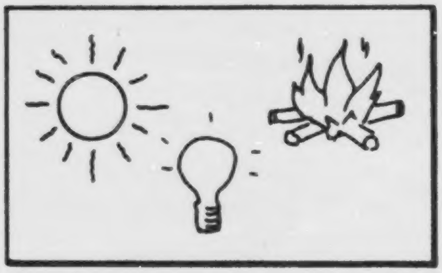
E.



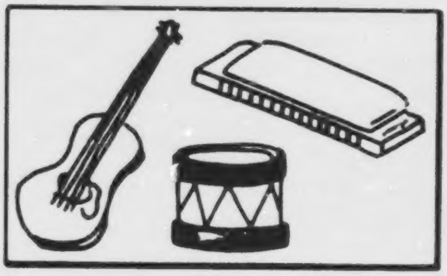
F.



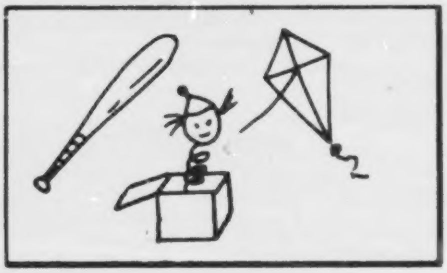
G.



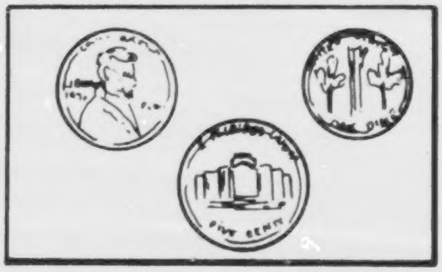
H.



I.



J.



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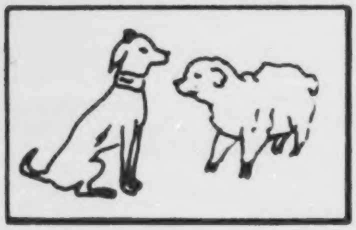
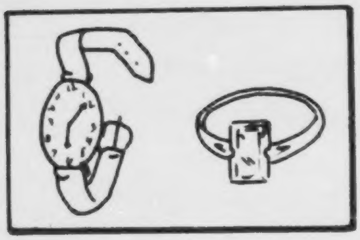
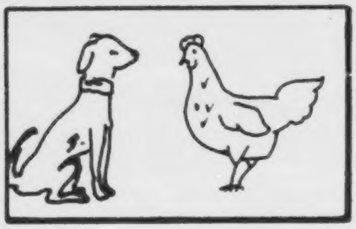
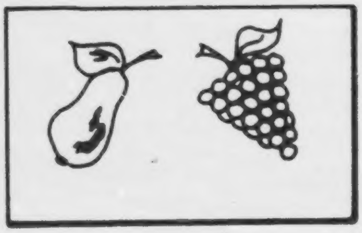
PICTURE CLASS MEMORY--Test Page

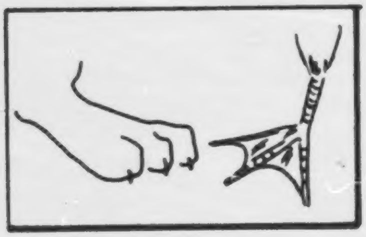
If the set of pictures belongs to a class you studied, mark the T-box.
If the set of pictures does NOT belong to a class you studied, mark the F-box.

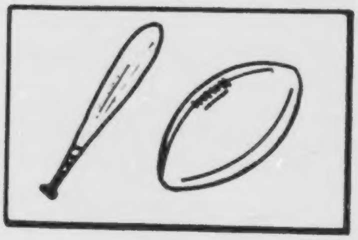
1. 

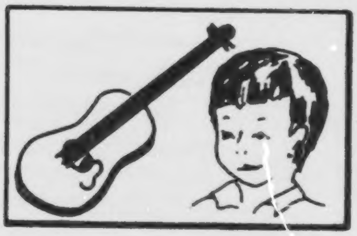
2. 

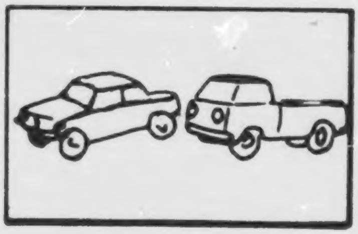
3. 

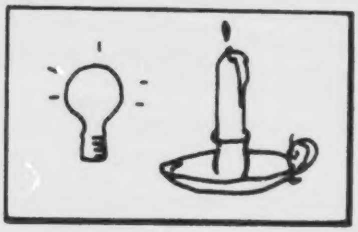
4. 

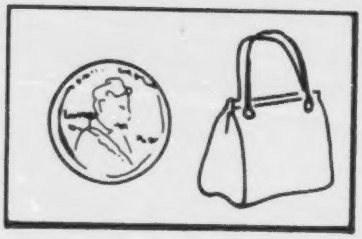
5. 

6. 

7. 

8. 

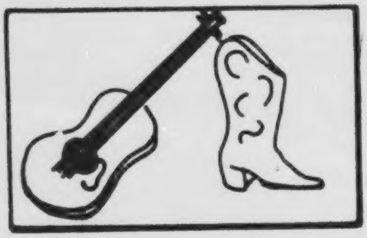
9. 

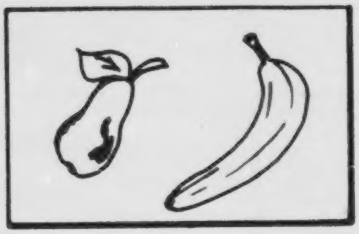
10. 

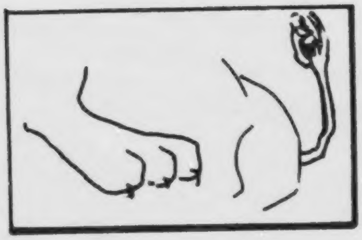
GO ON TO THE NEXT PAGE

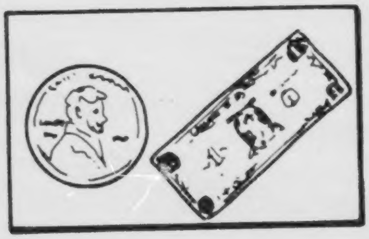
PICTURE CLASS MEMORY--Test Page

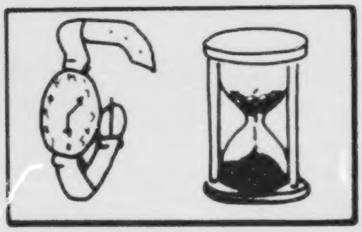
If the set of pictures belongs to a class you studied, mark the T-box.
If the set of pictures does NOT belong to a class you studied, mark the F-box.

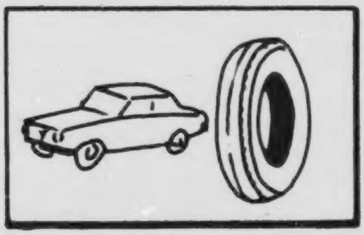
11. 

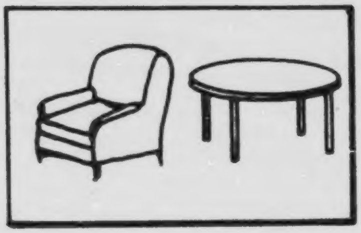
12. 

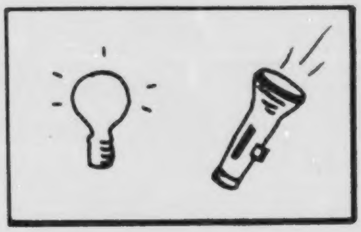
13. 

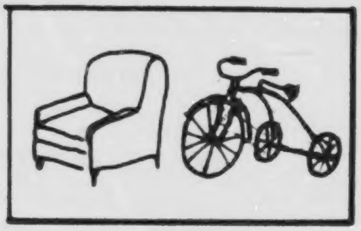
14. 

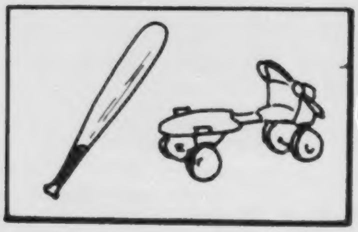
15. 

16. 

17. 

18. 

19. 

20. 

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

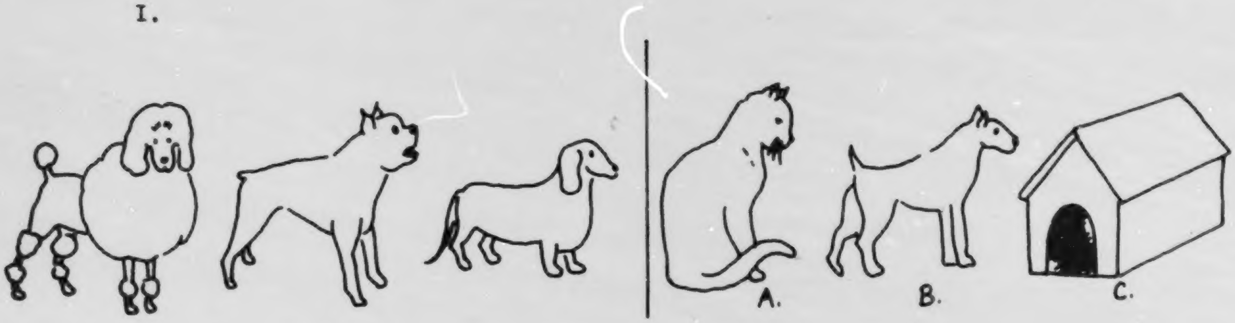
PICTURE CLASSIFICATION

DIRECTIONS

In each question there are 3 pictures of objects on the left which are alike in some way. On the right are 3 other pictures. One of these belongs with the pictures on the left for the same reason that they belong together. Decide which picture on the right is the correct answer. On your answer sheet mark the answer box with the same letter as your answer.

Here is an example:

I.



How are poodle, boxer and dachshund alike? They are all dogs. Which picture on the right belongs with them for the same reason that poodle, boxer, and dachshund belong together?

B. Terrier is also a dog. It is the best answer. The answer box below has been marked correctly.

I. ☐ ■ ☐ ☐ ☐

There are 20 questions. Be sure to answer all of them.

If you have any questions, ask them now.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

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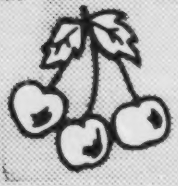
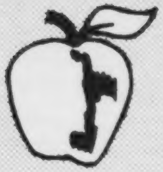
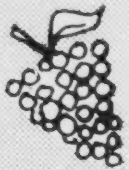
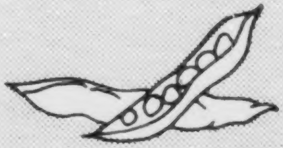
Research and Development Center for Cognitive Learning

PICTURE CLASSIFICATION

Which picture on the right belongs with the 3 pictures on the left?

1.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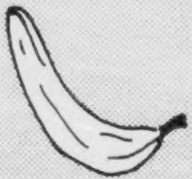
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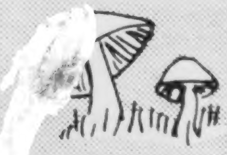
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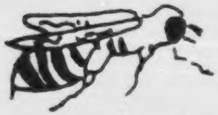
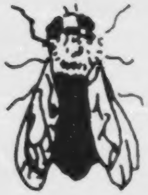
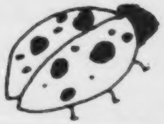
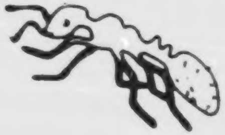
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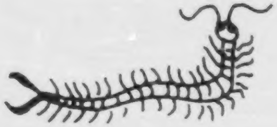
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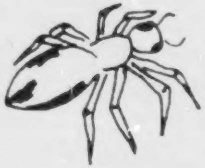
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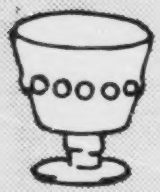
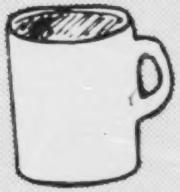
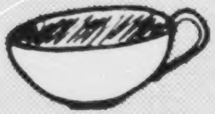
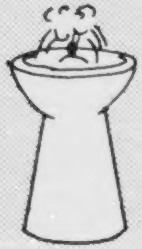
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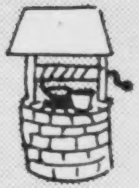
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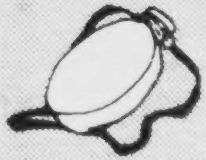
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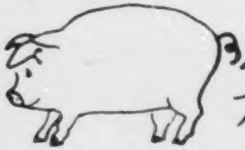
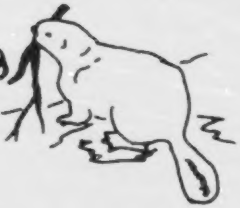
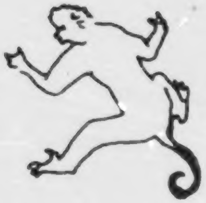
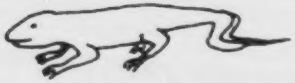
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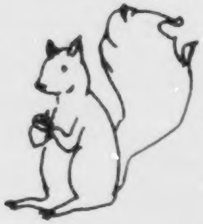
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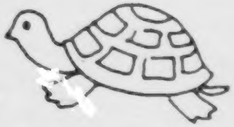
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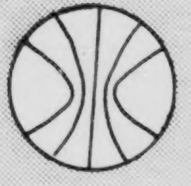
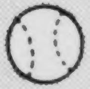
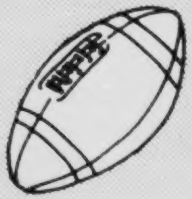
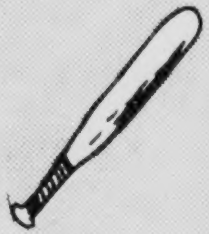
GO ON TO THE NEXT PAGE

PICTURE CLASSIFICATION

Which picture on the right belongs with the 3 pictures on the left?

5.

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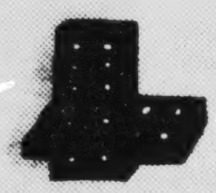

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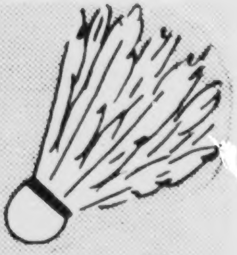

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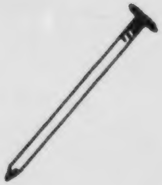
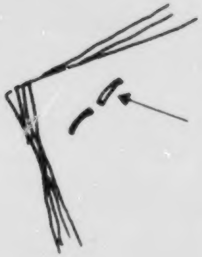
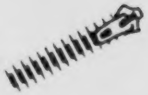
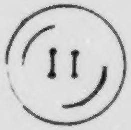

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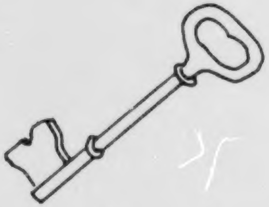

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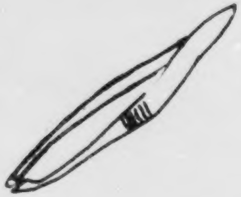

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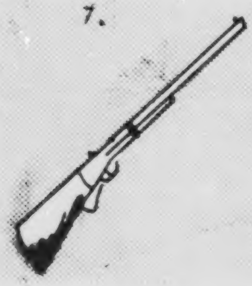
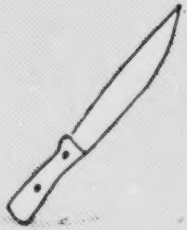
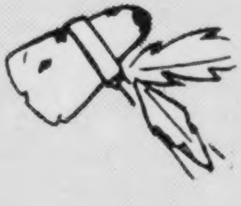
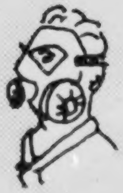

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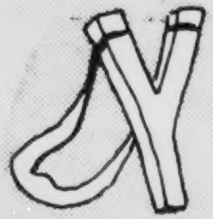

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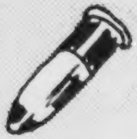

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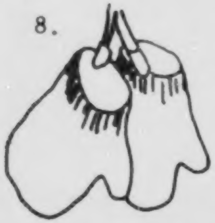
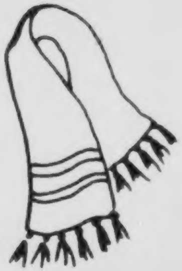
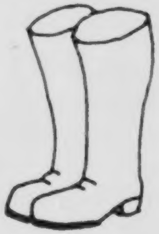
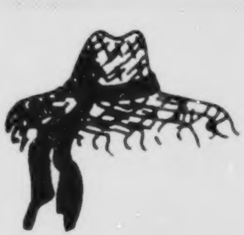

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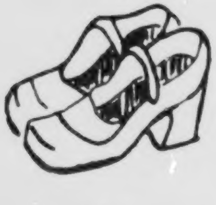

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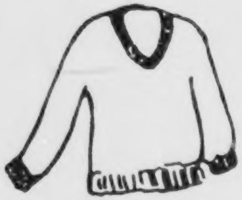

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GO ON TO THE NEXT PAGE

PICTURE CLASSIFICATION

Which picture on the right belongs with the 3 pictures on the left?

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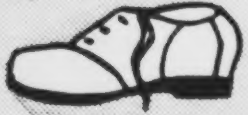
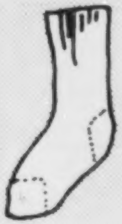
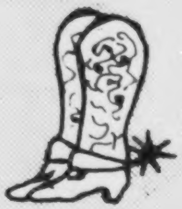
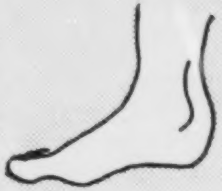

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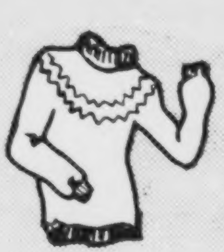

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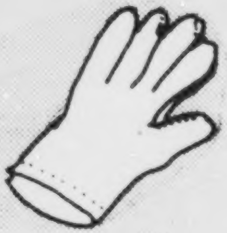

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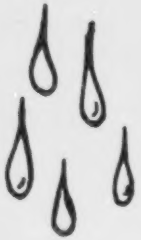
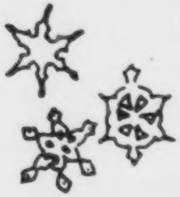
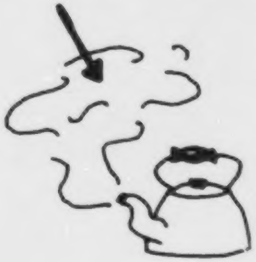
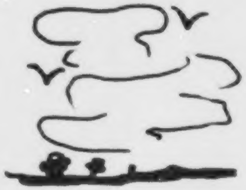

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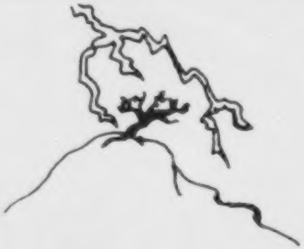

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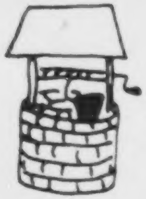

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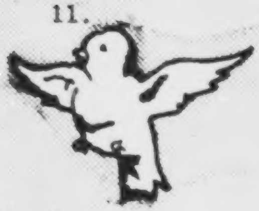
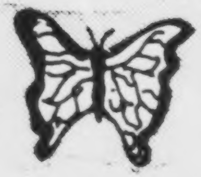
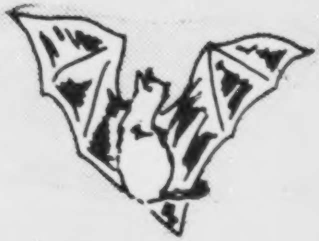
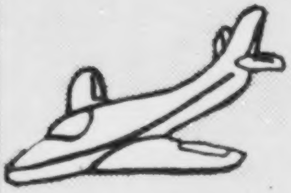

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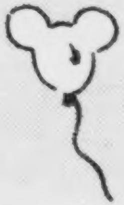

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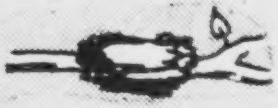
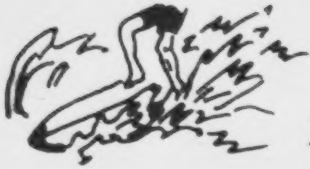
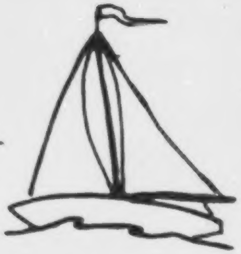
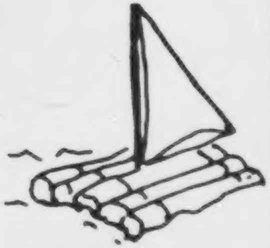
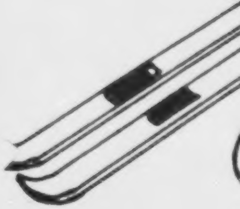


C.

12.

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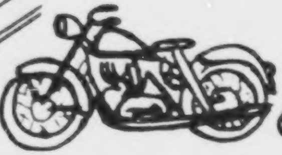

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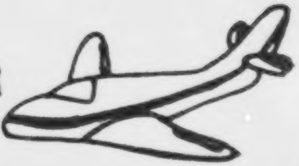


C.

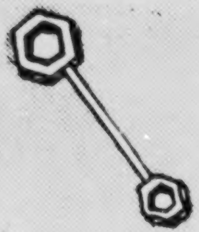
GO ON TO THE NEXT PAGE

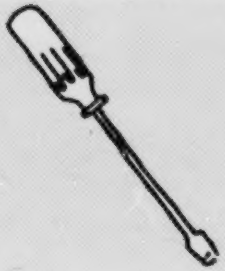
7

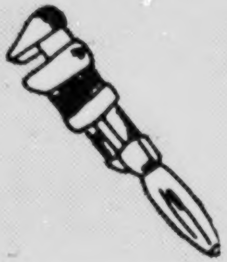
PICTURE CLASSIFICATION

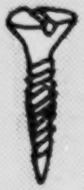
Which picture on the right belongs with the 3 pictures on the left?

13.









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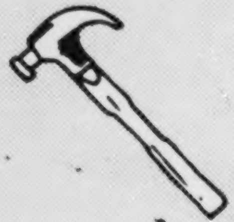

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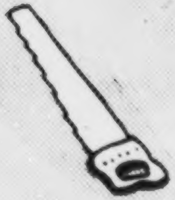

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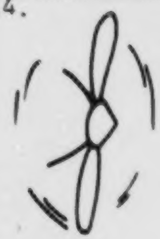

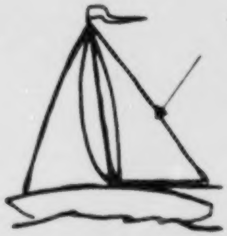

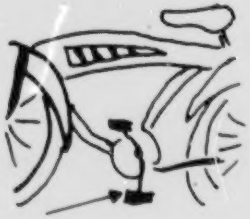

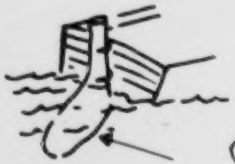

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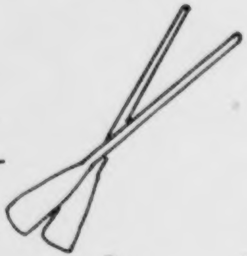

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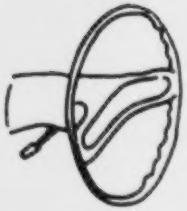

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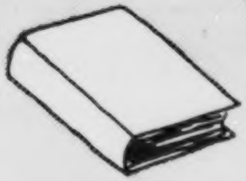

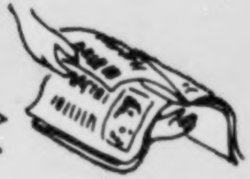

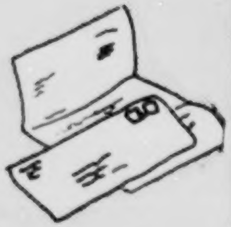

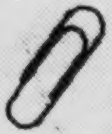

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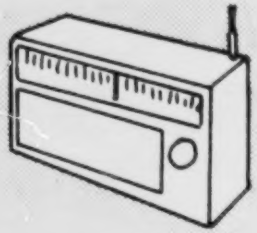

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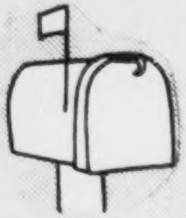

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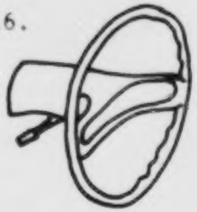

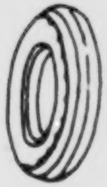

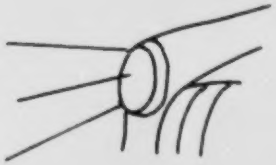

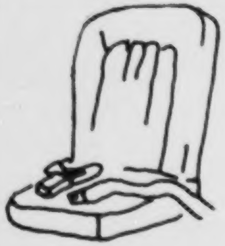

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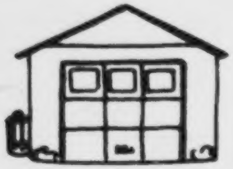

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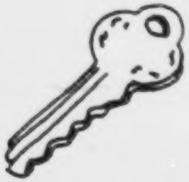


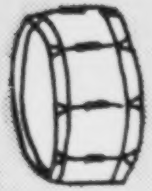
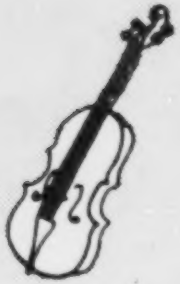
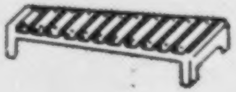
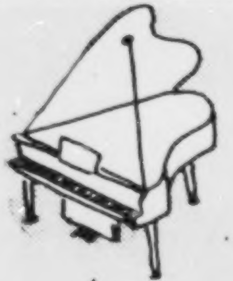
C.

GO ON TO THE NEXT PAGE

PICTURE CLASSIFICATION

Which picture on the right belongs with the 3 pictures on the left?

17.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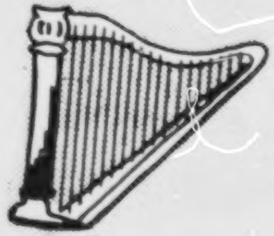
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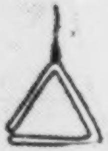
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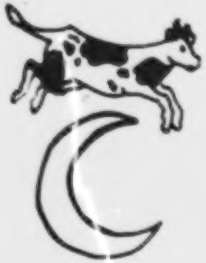
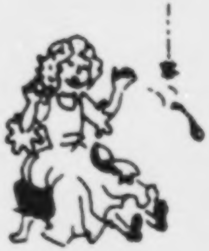
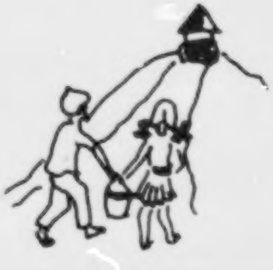
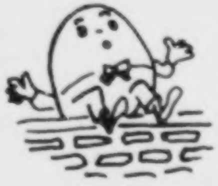
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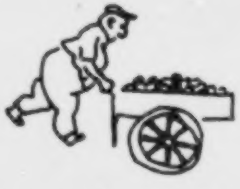
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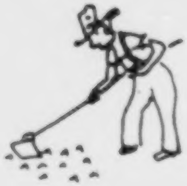
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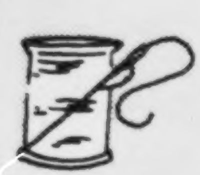
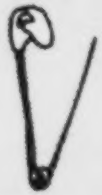
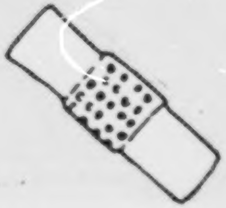
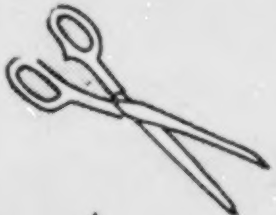
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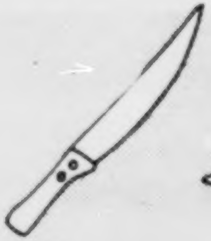
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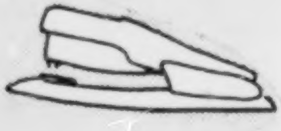
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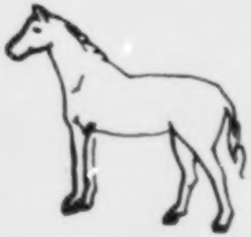
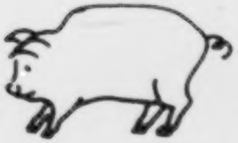
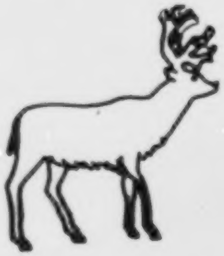
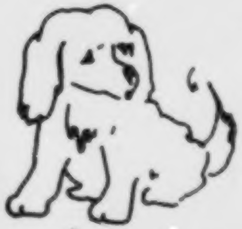
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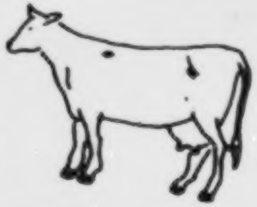
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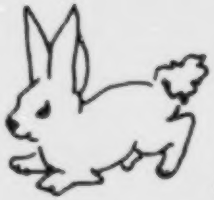

C.

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

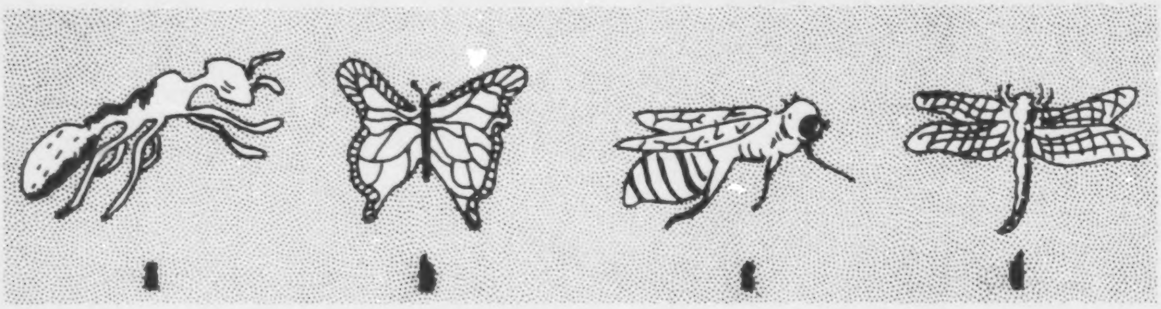
PICTURE EXCLUSION

DIRECTIONS

There are 4 pictures for each question. Three (3) of these pictures belong together. They form a class based on the meaning or use of what is pictured. One picture does not belong to this class. You are to find the picture that does not belong. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. You are to fill in the answer box on the answer sheet that has the same letter as the answer you picked.

Here is an example.

I.



Three of these belong to a class. Which picture does not belong? B. butterfly, C. bee, and D. dragonfly are all insects that fly. A. Ant is an insect, but it cannot fly. Its letter is A. The A-box is marked correctly below.

I. ■ B C D E

There are 20 questions. Be sure to answer all of them.

If you have any questions, ask them now.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

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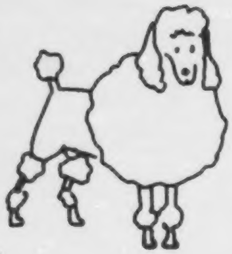
Research and Development Center for Cognitive Learning

PICTURE EXCLUSION

Which picture in each row does not belong?

❶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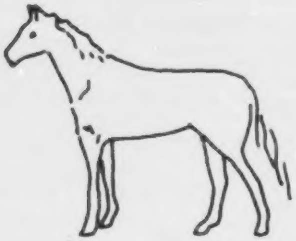
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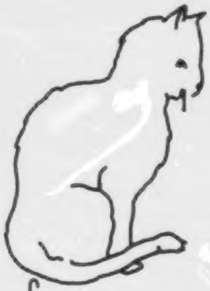
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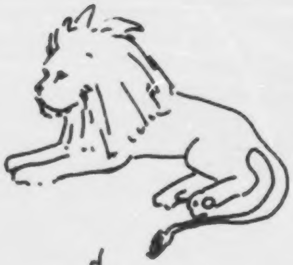
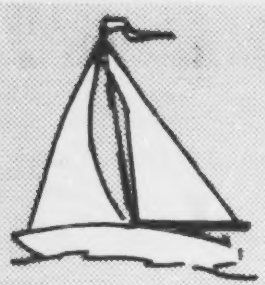

d

❷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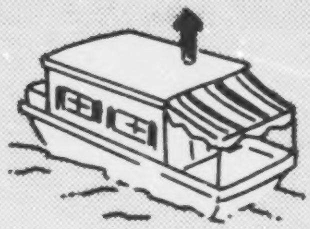
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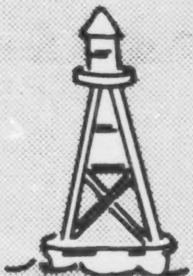
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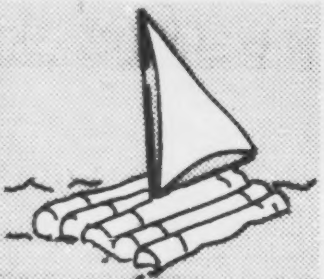
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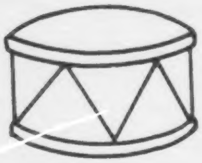
❸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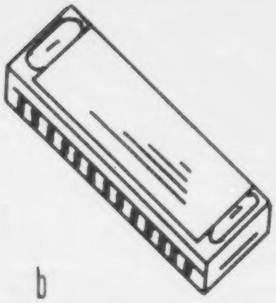
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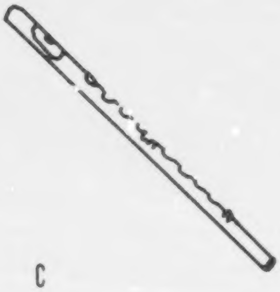
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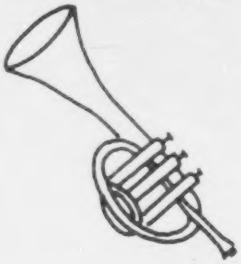
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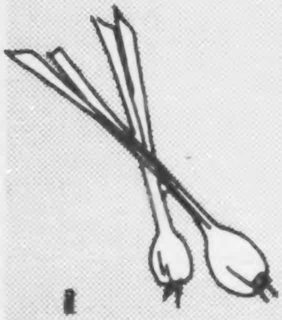
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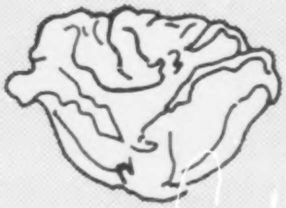
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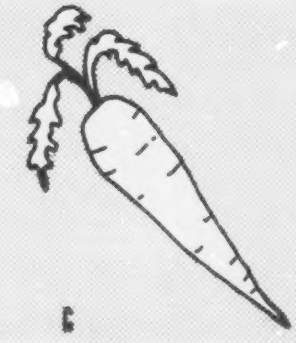
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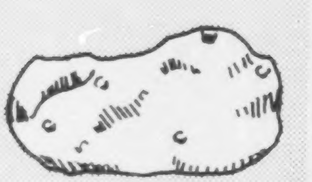
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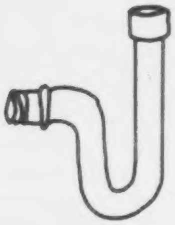
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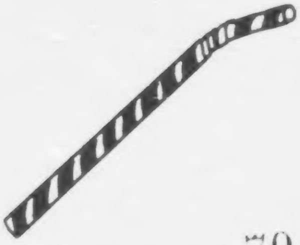
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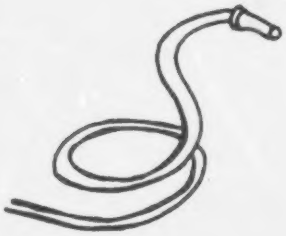
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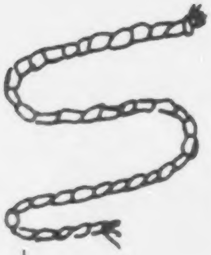
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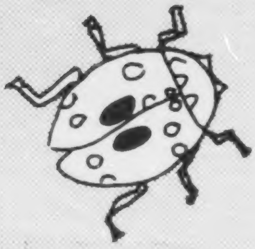
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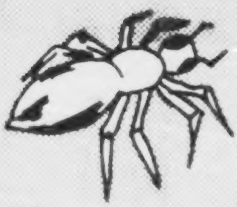
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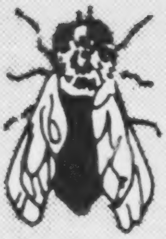
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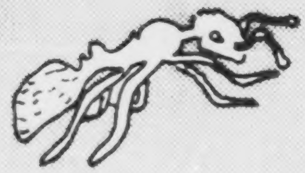
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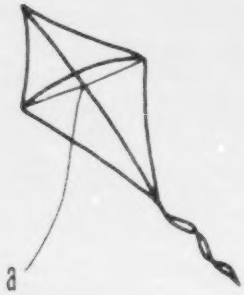
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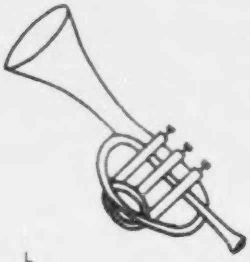
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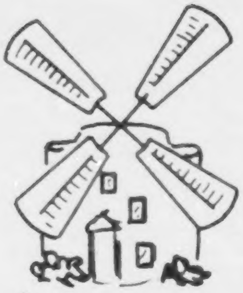
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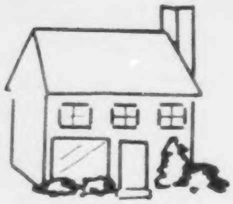
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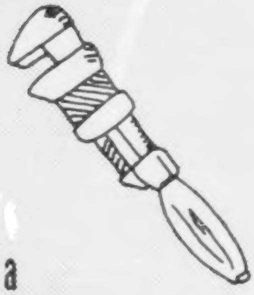
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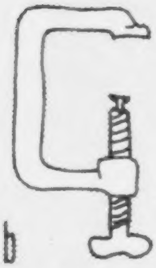
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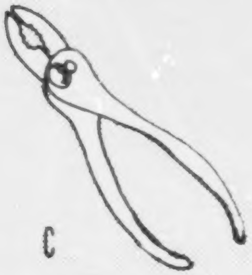
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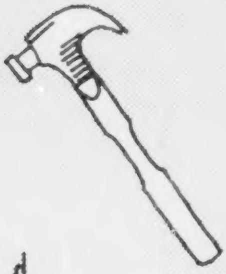
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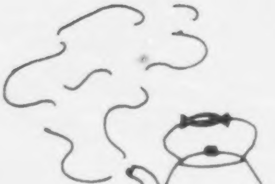
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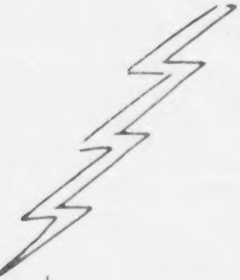
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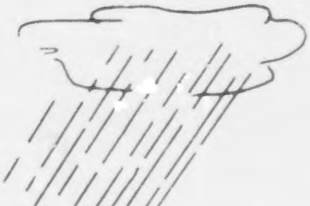
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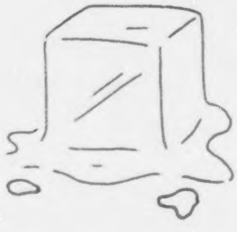
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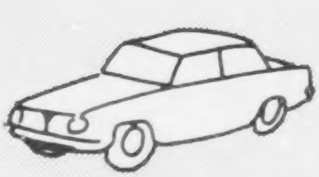
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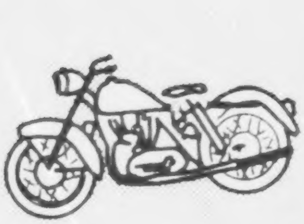
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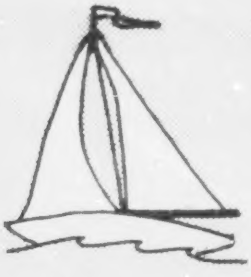
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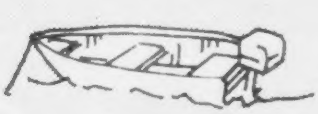
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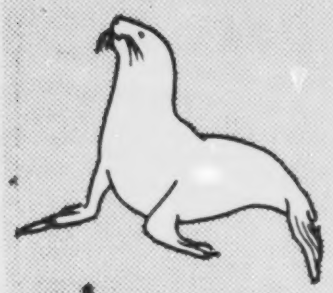
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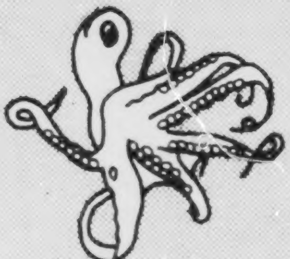
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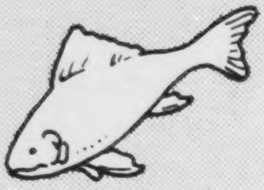
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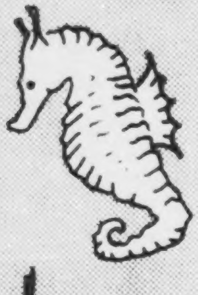
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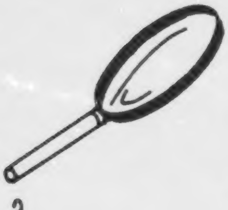
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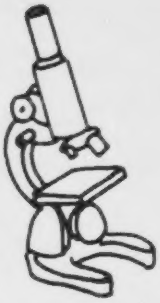
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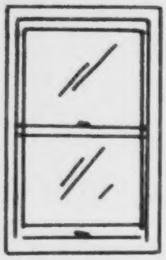
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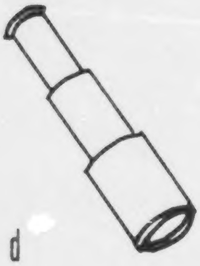
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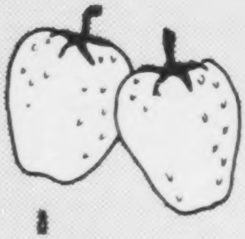
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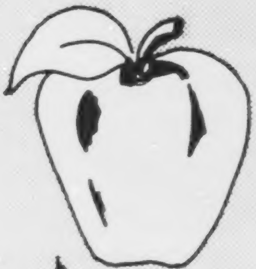
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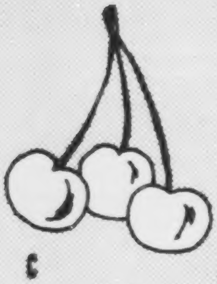
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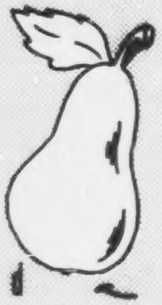
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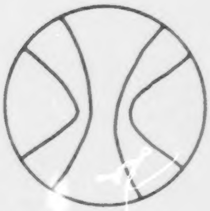
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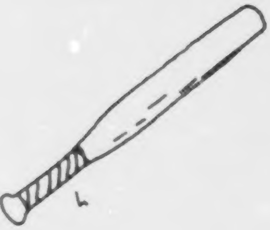
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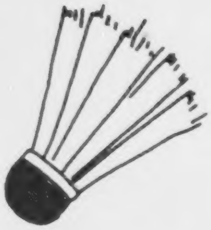
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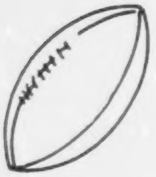
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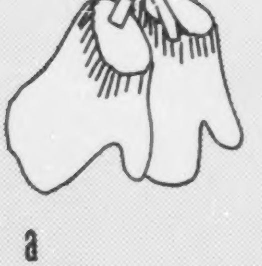
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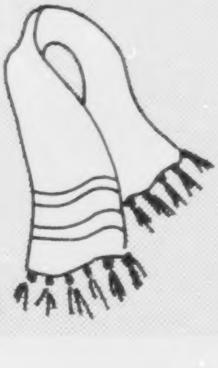
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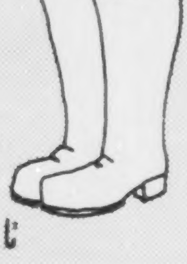
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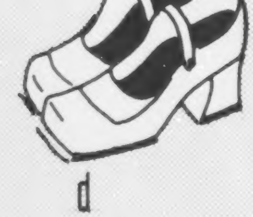
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PICTURE EXCLUSION

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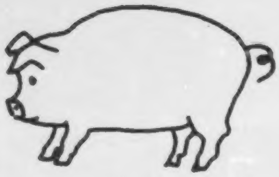
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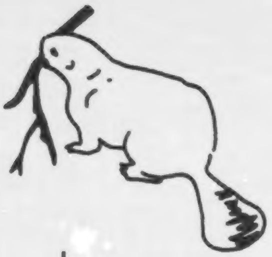
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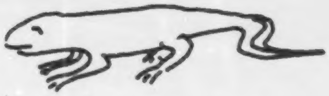
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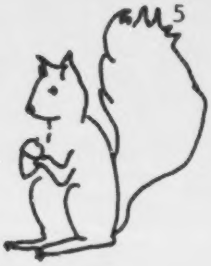
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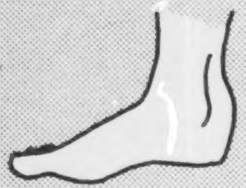
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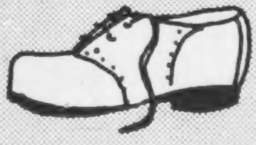
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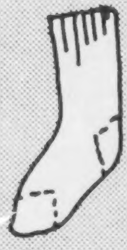
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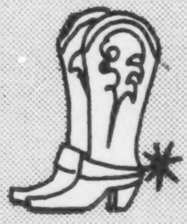
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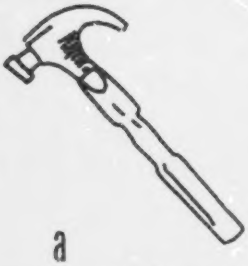
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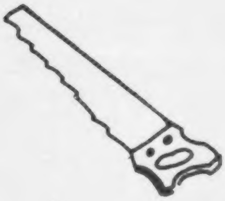
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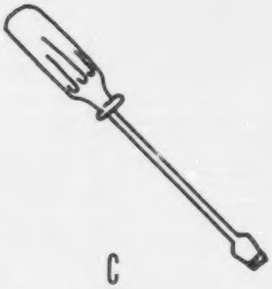
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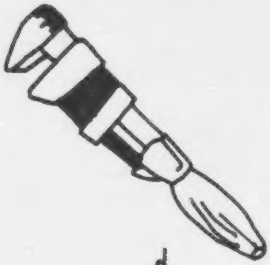
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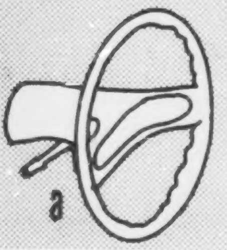
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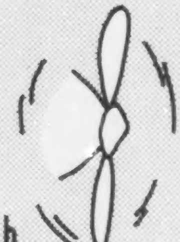
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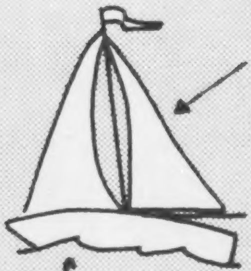
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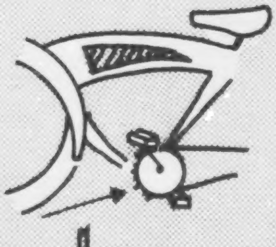
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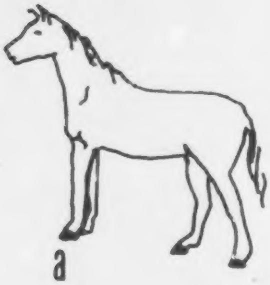
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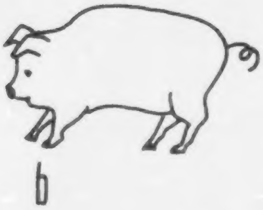
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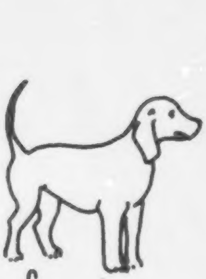
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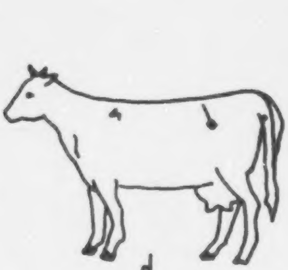
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STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

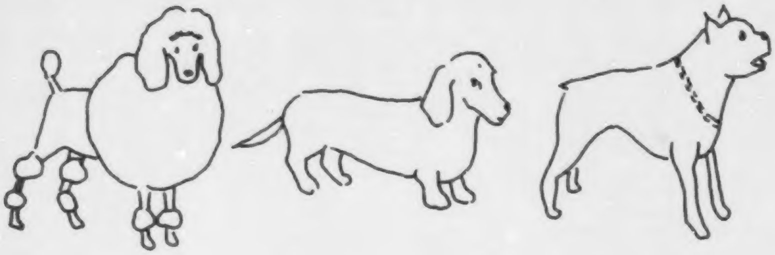
PICTURE GROUP NAME SELECTION

DIRECTIONS

In each question there are pictures of 3 objects or things that all belong in a group for some reason. For each question there are 3 possible names for the group of pictures. You must decide which name best describes the group. Then, on your answer sheet, mark the answer box with the same letter as the answer you have chosen.

Now look at an example:

I.



are all:

A. animals
B. brown animals
C. dogs

Look at the pictures carefully and choose the best name for the group.

You should have chosen C. dogs as the best name. All of the pictures show animals, and they could all be brown animals, but dogs is the best answer. It is the most specific, correct answer.

The row of answer boxes for this example has been marked correctly below:

I. ☐ ☐ ■ ☐ ☐

There are 20 groups of pictures. Be sure to pick the best name for each one.

If you have any questions, ask them now.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

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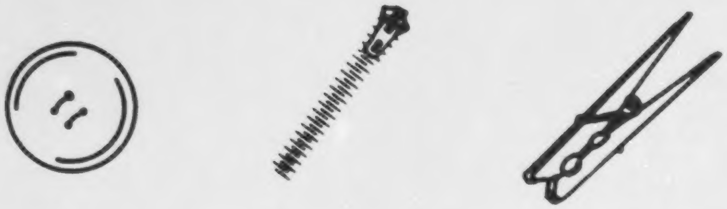
Research and Development Center for Cognitive Learning

PICTURE GROUP NAME SELECTION

Pick the best name for each group.

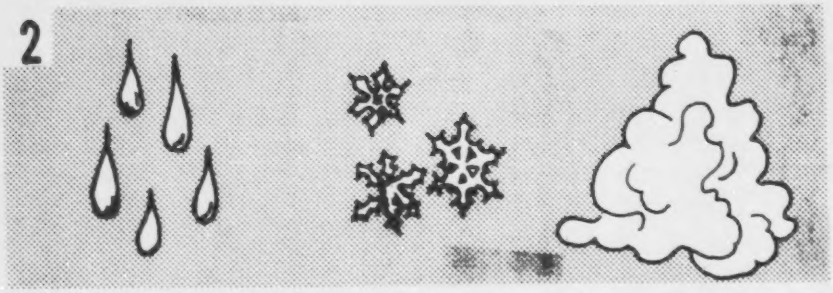
1



are all:

A. decorations
B. fasteners
C. parts of clothing

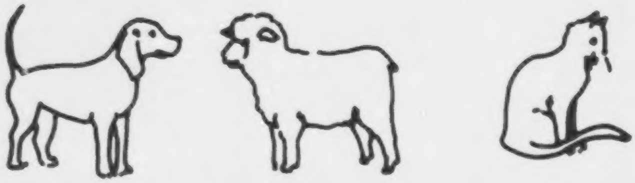
2



are all:

A. forms of water
B. kinds of weather
C. seasons

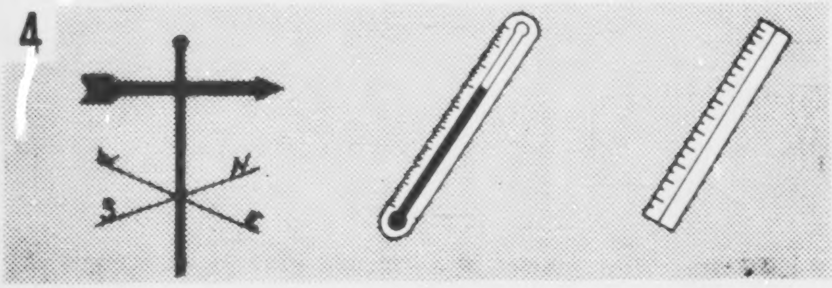
3



are all:

A. animals
B. mammals
C. wild animals

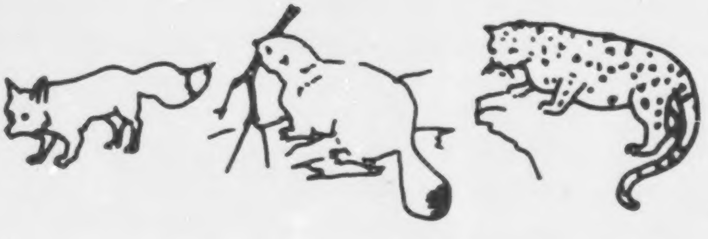
4



are all:

A. tools
B. measuring instruments
C. **instruments** for
measuring direction

5



are all:

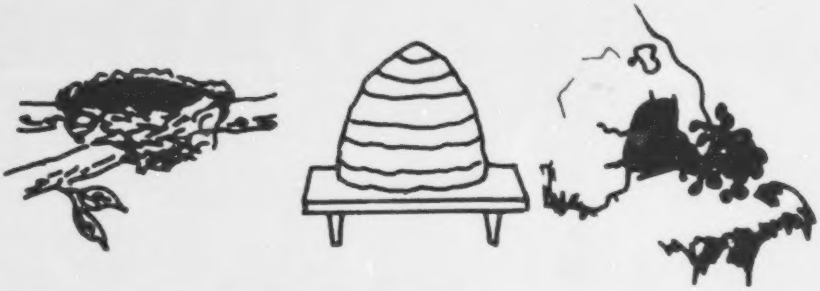
A. cave-dwelling animals
B. rare animals
C. fur-bearing animals

GO ON TO THE NEXT PAGE

PICTURE GROUP NAME SELECTION

Pick the best name for each group.

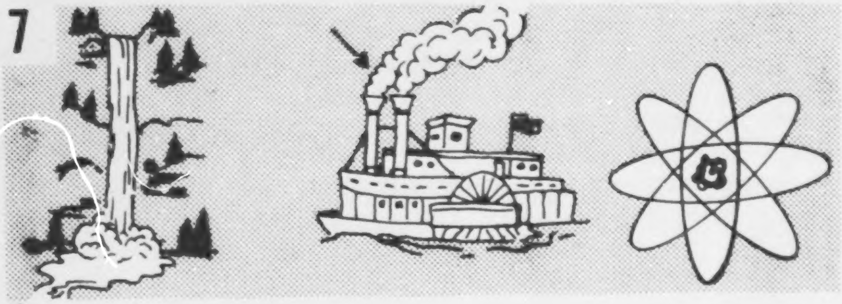
6



are all:

A. shelters
B. coverings
C. homes

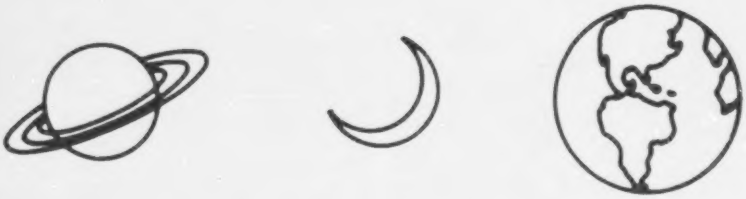
7



are all:

A. liquids
B. gases
C. power sources

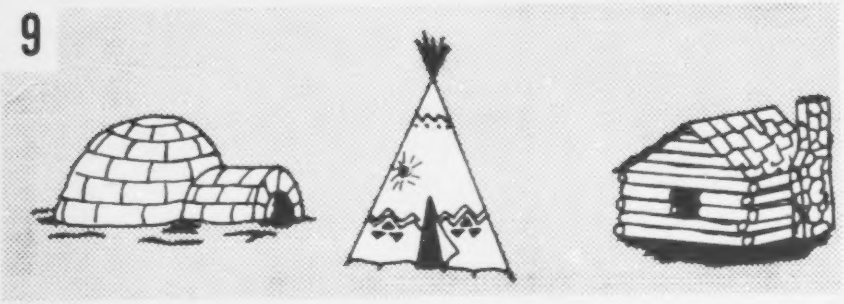
8



are all:

A. satellites
B. stars
C. planets

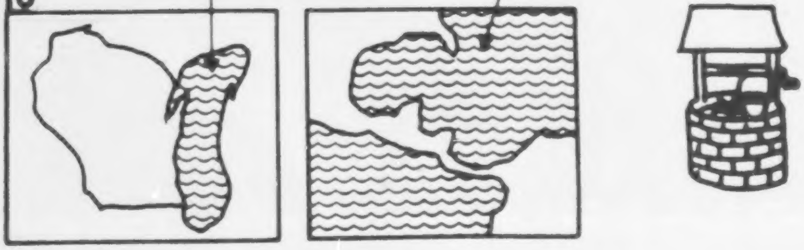
9



are all:

A. tents
B. dwellings
C. shacks

10



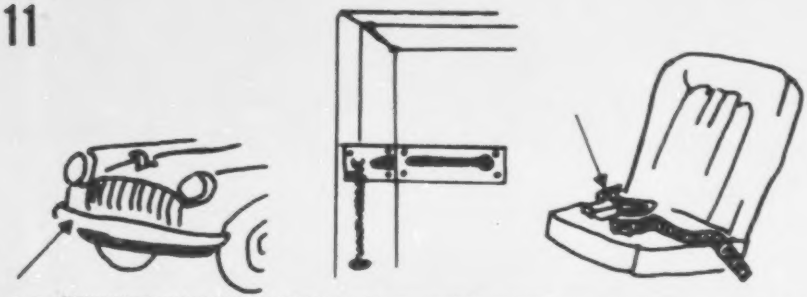
are all:

A. places where fish live
B. man-made bodies of water
C. sources of drinking water

GO ON TO THE NEXT PAGE

Pick the best name for each group.

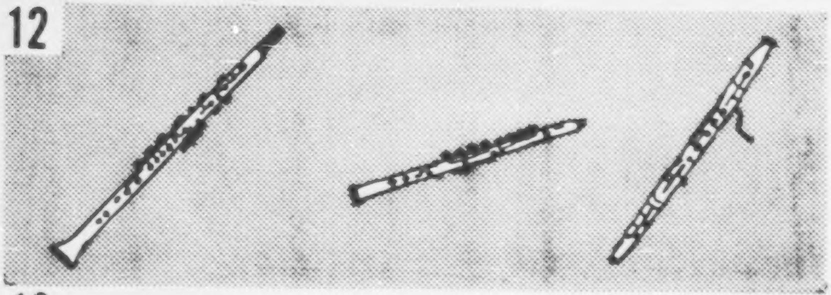
11



are all:

A. fastening devices
B. safety devices
C. mechanical devices

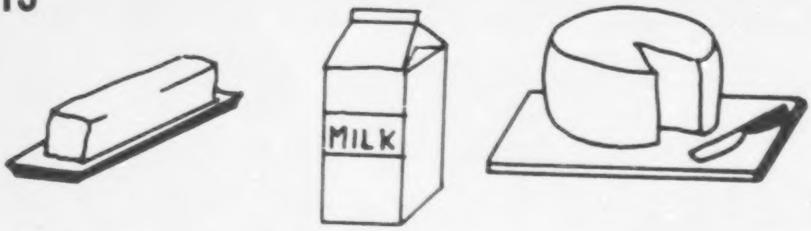
12



are all:

A. woodwind instruments
B. brass instruments
C. musical instruments

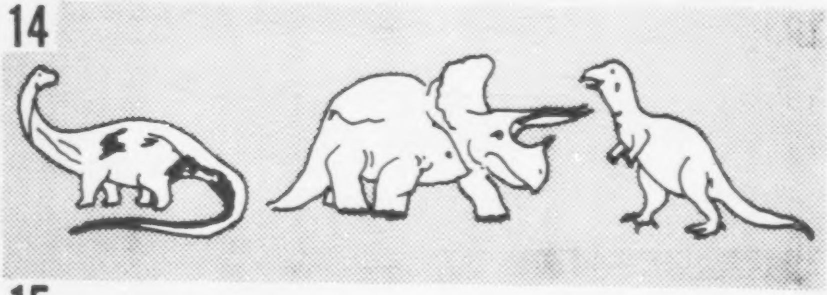
13



are all:

A. dairy products
B. animal products
C. foods

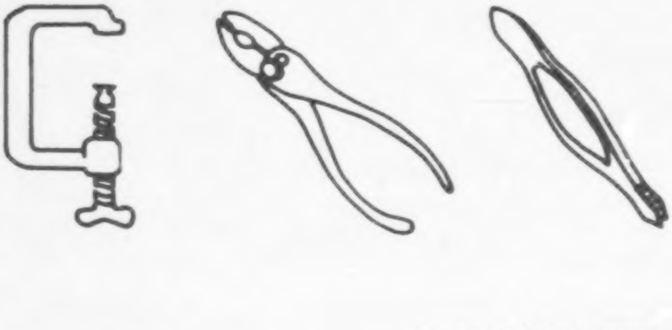
14



are all:

A. wild animals
B. reptiles
C. prehistoric animals

15



are all:

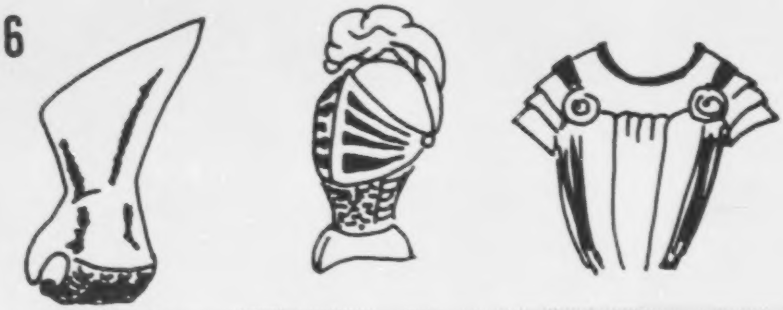
A. wrenches
B. gripping tools
C. tools

GO ON TO THE NEXT PAGE

PICTURE GROUP NAME SELECTION

Pick the best name for each group.

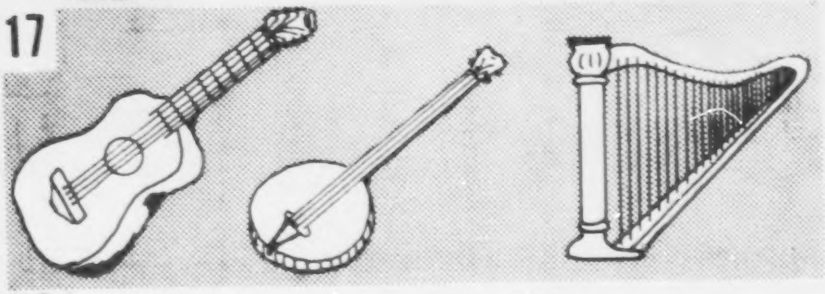
16



are all:

A. clothing
B. weapons
C. armor

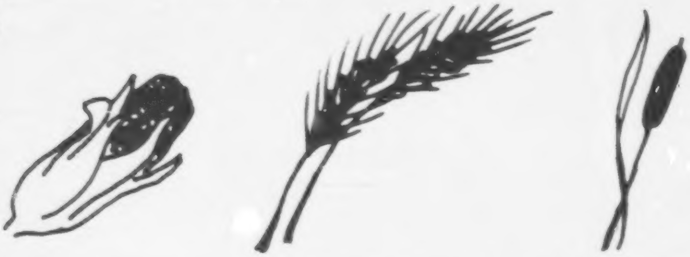
17



are all:

A. string instruments
B. brass instruments
C. musical instruments

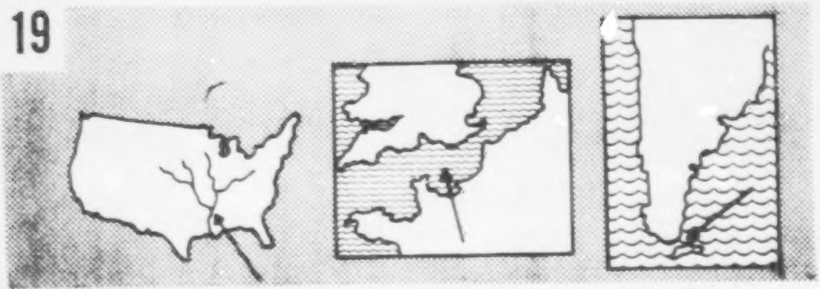
18



are all:

A. grains
B. grasses
C. foods

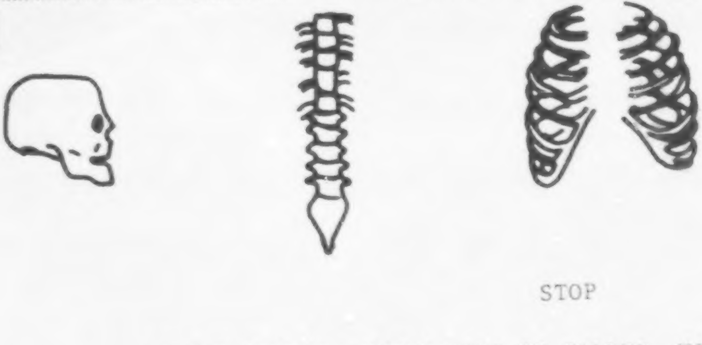
19



are all:

A. bodies of water
B. waterways
C. parts of oceans

20



are all:

A. parts of human skeleton
B. parts of human body
C. bones

STOP

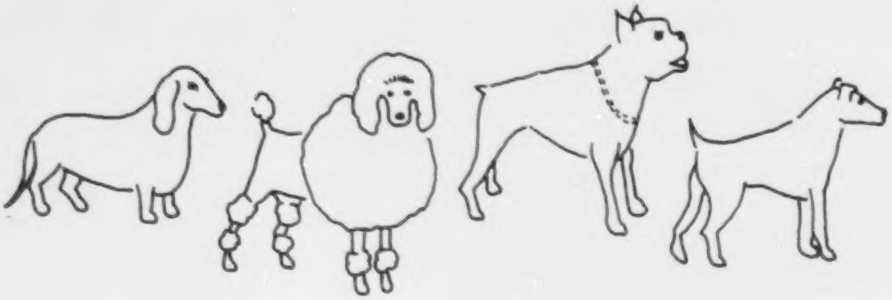
IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

PICTURE GROUP NAMING

DIRECTIONS

In each question there are 4 pictures of objects which are alike in some way. In the blank space in your booklet you are to print (or write clearly) the best general name for the group of objects. Be as specific as possible.

Here is an example:



are all: ____________________

Dachshund, poodle, boxer, and terrier are all animals, but the best (most specific) name for the group is dogs.

There are 20 questions. Be sure to answer all of them.

If you have any questions, ask them now.

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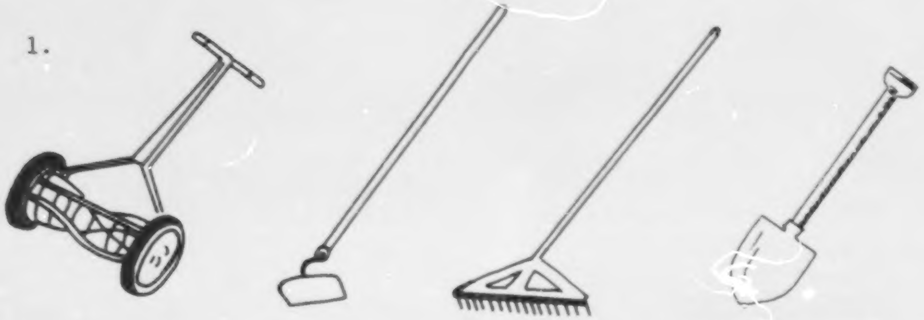
PICTURE GROUP NAMING

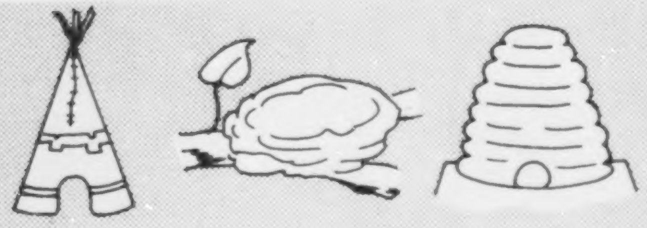
1.



are all:

____

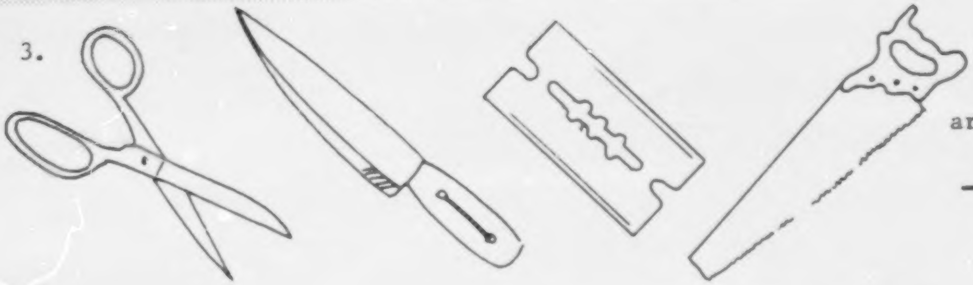
2.



are all:

____

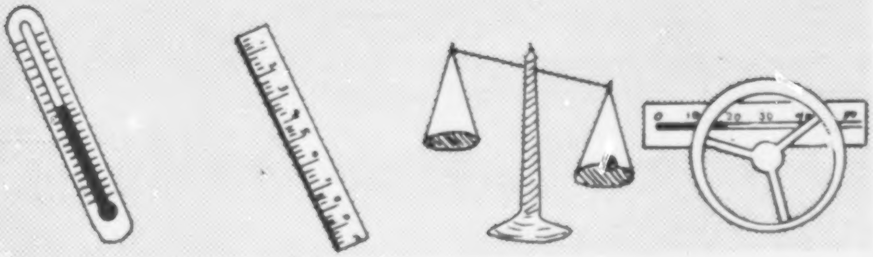
3.



are all:

____

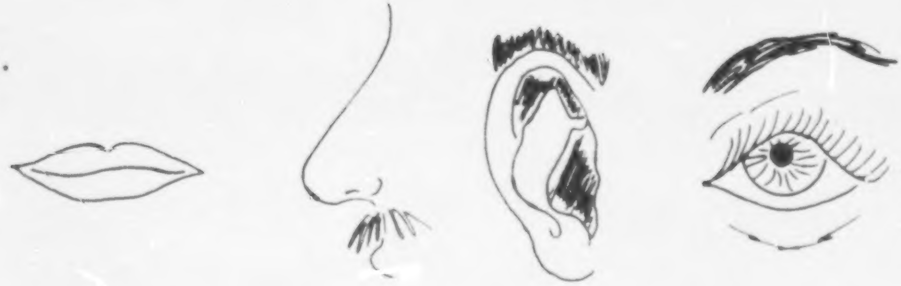
4.



are all:

____

5.



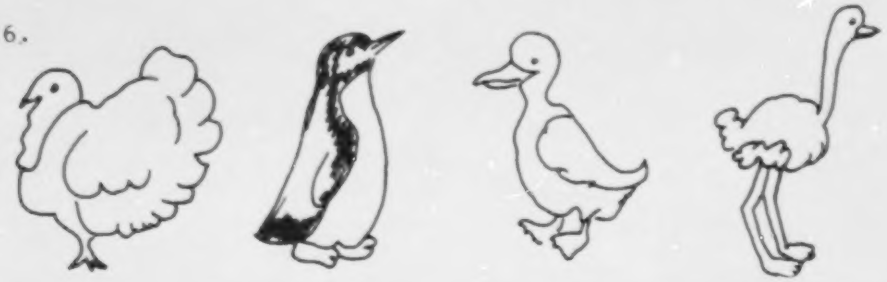
are all:

____

GO ON TO THE NEXT PAGE

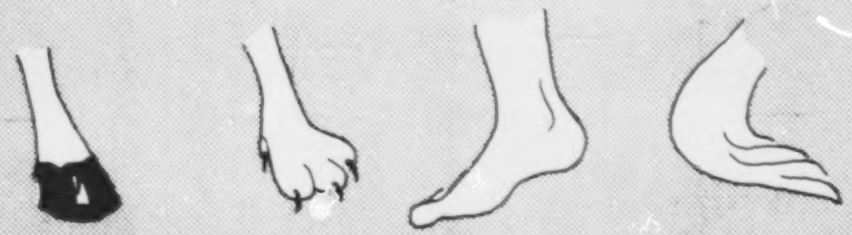
PICTURE GROUP NAMING

6.



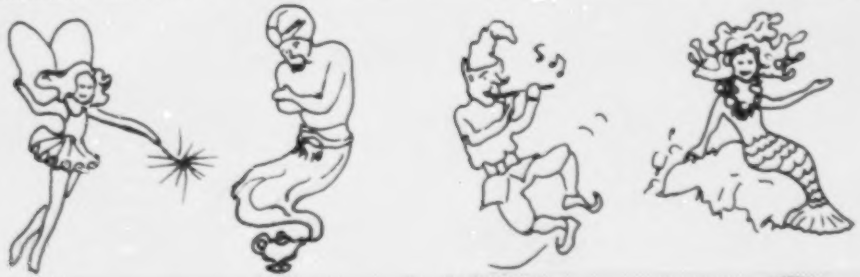
are all: ____________

7.



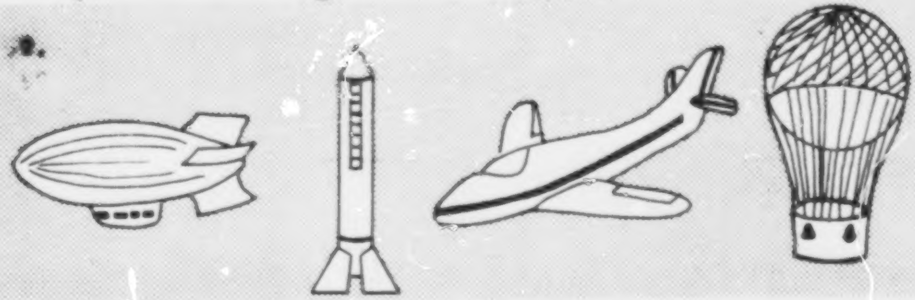
are all: ____________

8.



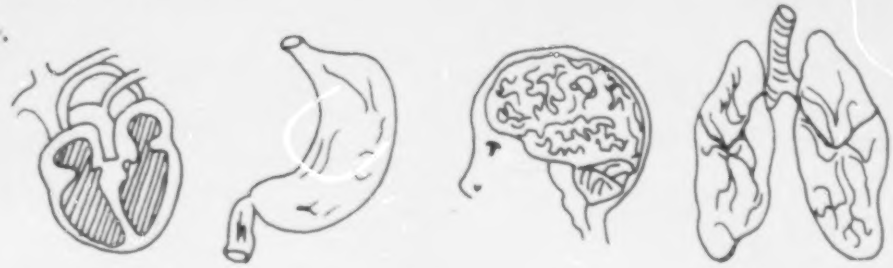
are all: ____________

9.



are all: ____________

10.

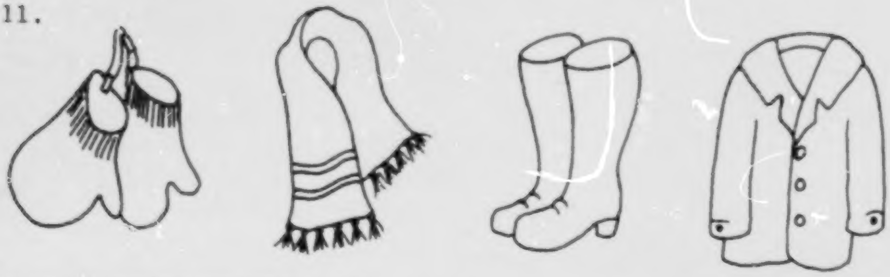


are all: ____________

GO ON TO THE NEXT PAGE

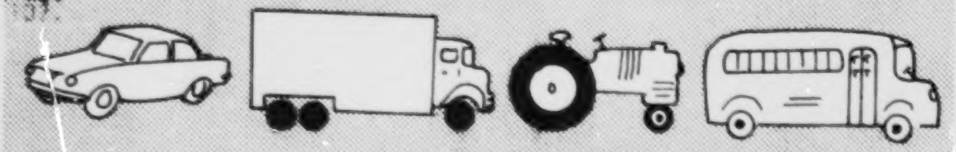
PICTURE GROUP NAMING

11.



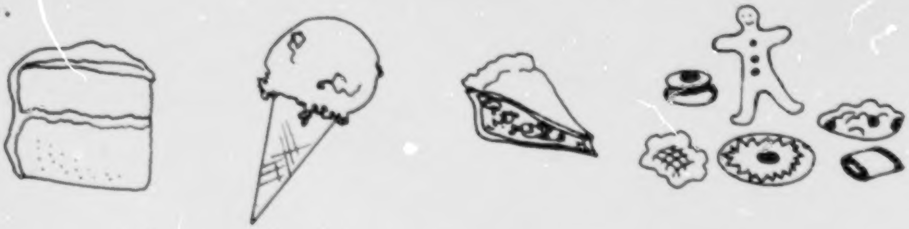
are all: ____________________

12.



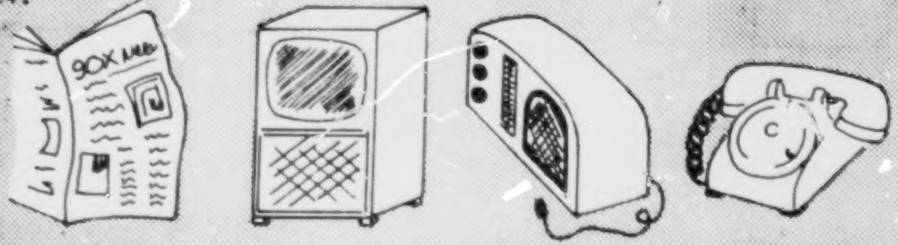
are all: ____________________

13.



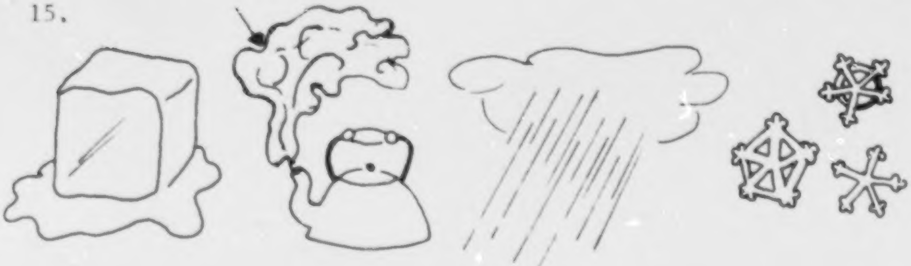
are all: ____________________

14.



are all: ____________________

15.

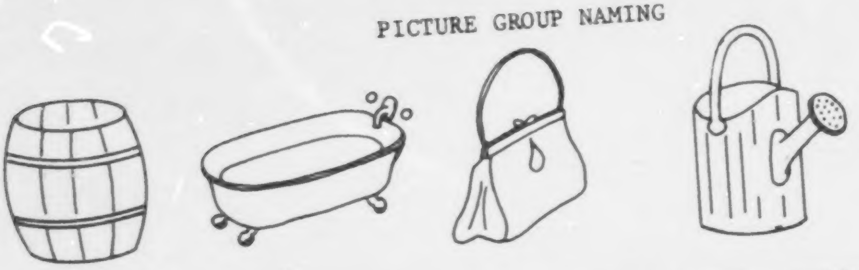


are all: ____________________

GO ON TO THE NEXT PAGE

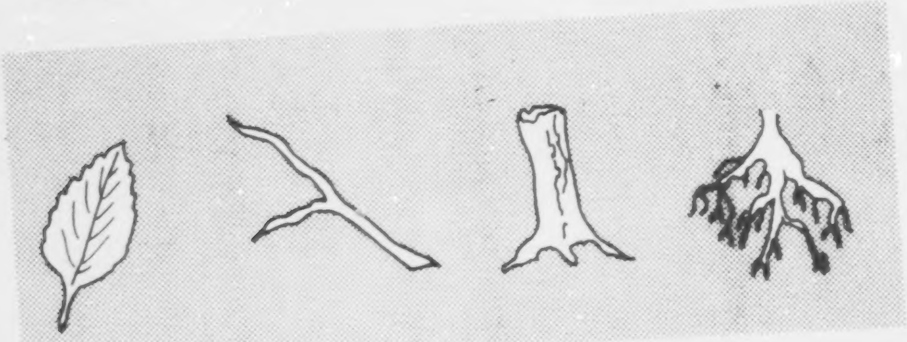
PICTURE GROUP NAMING

16.



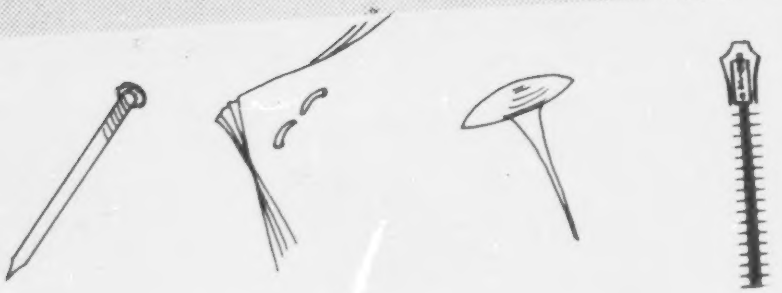
are all: ____________________

17.



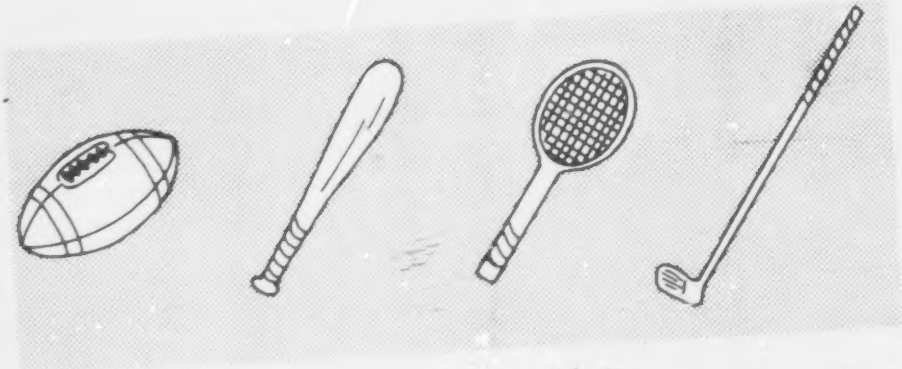
are all: ____________________

18.



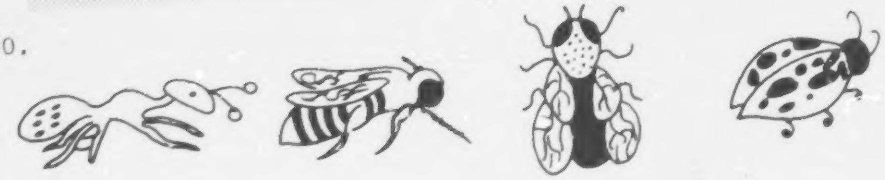
are all: ____________________

19.



are all: ____________________

20.



are all: ____________________

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST.

REMEMBERING CLASSES: MEMBERS

DIRECTIONS

We sometimes think of objects that are alike in some way as all belonging to a "class" of things. For instance, chair, desk, and bed are all in the "class" FURNITURE. In this test we would like to see how well you can remember the "classes" of some objects. First you will have 1½ minutes to study a page of groups of things. On this study page there will be 10 groups of things listed. Each group forms a class--but you will not be told the name of the class. For example, one group of things may be:

A. chair
desk
bed

You will not be told that they are in the class FURNITURE. You will have to discover that for yourself--and you must remember it!

Then, for the test, there is a page of 20 questions. On this page you will find pairs of words which are questions about each class of things on the study page. For example, two pairs of words that might be questions about CHAIR-DESK-BED are:

I. chair
sofa

II. chair
door

For each of these pairs you must decide if the 2 things belong to the SAME CLASS of things as the class you are supposed to remember. You cannot look back at the study page. You will have to try to remember the class of things that you see.

One word will always be in the class of things listed on the study page and in each of the 2 pairs of words that are questions about its class. In our example, CHAIR is in the study list: I. chair
desk
bed

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REMEMBERING CLASSES: MEMBERS

Directions (continued):

CHAIR is also in both of the two questions: I. chair II. chair
sofa door

Sofa and door were not in the study group of three things.

Look at the first question. I. chair
sofa

Does this pair of things belong to the same class of things as the class you remember from the study page?

Yes, both chair and sofa belong the class FURNITURE. The answer for I. chair, sofa is YES. The row of answer boxes for this question would be marked like this:

I. ■ ☐ ▨ ▨ ▨

T is for true, or "YES," answers.

Now look at the second question. II. chair
door

Does this pair of things belong to the same class of things as the class you remember from the study page?

No, DOOR does not belong to the class FURNITURE. Chair and door are alike in that both are found in a house, but they are not both in the same class that you studied. The answer box for this question would look like this:

II. ☐ ■ ▨ ▨ ▨

F is for false, or "NO," answers.

On the study page you will see 10 groups of words. Look at these and study them very carefully so that you can remember the classes of things you have seen.

After 1½ minutes I will tell you to turn the page, and you will find a page of 20 questions made up of 2 words each. Look at each question and try to remember whether it belongs to the same class as one that you saw on the study page. The answer for any question could be yes or no. If you think the class is the same as one you studied and remember, mark the T-box. If it is not the same, mark the F-box.

REMEMBERING CLASSES: MEMBERS

Directions (continued):

T means YES

F means NO

You will do this for all 20 of the questions.

You must remember 10 classes of things from the 1½ minutes of study time you will have. Once you turn the page you cannot look back at it.

The two things for each of the questions will be alike in some way. You must decide if they are alike in the same way as one of the groups that you studied. That is, do they belong to the same class?

If you have any questions, ask them now.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

REMEMBERING CLASSES: MEMBERS

Study Page

A. daisy
rose
poppy

B. iron
gold
nickel

C. coffee
tea
milk

D. sour
sweet
bitter

E. morning
afternoon
evening

F. ounce
pound
gram

G. pine
oak
elm

H. shoelace
lasso
rope

I. potato
bean
pea

J. cat
horse
dog

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

REMEMBERING CLASSES: MEMBERS

Test Page

If the pair of words belongs to a class you studied, mark the T box.

If the pair of words does NOT belong to a class you studied, mark the F box.

1. pound
   ton
2. daisy
   pansy
3. dog
   collar
4. oak
   spruce
5. potato
   corn
6. lasso
   string
7. morning
   breakfast
8. milk
   cow
9. oak
   birch
10. nickel
    lead
11. pound
    beat
12. potato
    carrot
13. lasso
    saddle
14. dog
    bark
15. daisy
    grass
16. milk
    ice cream
17. sweet
    salty
18. nickel
    dime
19. morning
    awaken
20. sweet
    candy

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

REMEMBERING CLASSES: NAMES

DIRECTIONS

We often think of things as belonging to a "class." For example, CAT and DOG belong to the class ANIMALS. This test is about "classes." In the first part of the test you will have 1½ minutes to study a page with 10 groups of 4 words each. In each group the 4 things all belong to one class. You will not be told the name of the class. You must discover it for yourself.

Here is an example of a group of 4 things like the groups you will see on the study page:

Example -- DOG
CAT
HORSE
RABBIT

What "class" do these 4 things belong to? Yes, they all belong to the class ANIMALS. You must remember the name of the class (ANIMALS) because after 1½ minutes you will turn to another page, and you will see 20 names of classes. Only some of them will be the names of classes that you are to remember from the study page.

In our example, if you saw the class name I. ANIMALS on the test page, you would mark the T-box for true, or "YES," like this:

I. ■ ☐ ☐ ☐ ☐

because you remember that DOG-CAT-HORSE-RABBIT are in the same class, ANIMALS.

If you saw the class name II. FRUITS on the test page, you would mark the F-box for false, or "NO," like this:

II. ☐ ■ ☐ ☐ ☐

because you did not see a group of things that belong to the class FRUITS.

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REMEMBERING CLASSES: NAMES

Directions (continued):

Look at each class name and try to remember if it names a class of things that you studied on the study page. Any name can be yes or no. If you think the name is for a class that you studied, mark the T-box. If it is not, mark the F-box.

T means YES

F means NO

You are to remember the names for 10 classes of things from the study page. After 1½ minutes you must turn the study page and then you may not look back at it.

If you have any questions, ask them now.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

REMEMBERING CLASSES: NAMES

Study Page

A. apple
orange
banana
peach

B. cottage
cabin
house
palace

C. hammer
pliers
saw
screwdriver

D. tuna
herring
trout
bass

E. red
blue
green
yellow

F. chocolate
mint
gumdrop
lollipop

G. oak
maple
pine
elm

H. attic
kitchen
living room
cellar

I. hide-and-seek
basketball
baseball
tag

J. headlight
sun
lantern
candle

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

REMEMBERING CLASSES: NAMES

Test Page

If the class name is one you studied, mark the T box.

If the class name is not one you studied, mark the F box.

1. vegetables
2. fruits
3. homes
4. insects
5. tools
6. fish
7. seasons
8. numbers
9. rooms
10. dances
11. colors
12. lights
13. nuts
14. birds
15. flowers
16. candies
17. games
18. toys
19. trees
20. furniture

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

REMOTE CLASS COMPLETION

DIRECTIONS

You will be given three words. Your job is to find a fourth word which goes with all three. Write this word in the space at the right.

For example, what word do you think goes with these three:

Example A: right fist shake ________

The answer is "hand." We have a right hand; a hand can be made into a fist; and "hand" is part of the word "handshake."

Let's look at another one.

Example B: flowing creek Amazon ________

In this case the correct word is "river." A river is usually flowing; it is like a creek in many ways; and a well-known river is the Amazon.

Here are a couple more.

Example C: rest mattress time ________

Example D: hot apple wagon ________

Many of the items that follow are not easy and you will have to think about some of them for a while. Others will be easy. If you have trouble with some groups of three, go on to the next and come back to them later. Give only one answer to each item.

There are 25 questions. Be sure to answer all of them

If you have any questions, ask them now.

DO NOT TURN THIS PAGE UNTIL ASKED TO DO SO

Test adapted from: Warren, T. F., and Davis, G. A., Distant Linking Exam (WADDLE), 1970.

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REMOTE CLASS COMPLETION

Find a fourth word that goes with all three.

1. diaper bottle born ____________ 1.

2. pillow drowsy deep ____________ 2.

3. lock close knock ____________ 3.

4. loaf toast flour ____________ 4.

5. imagine pillow bad ____________ 5.

6. castle majesty rule ____________ 6.

7. frigid sneeze shiver ____________ 7.

8. king cub fierce ____________ 8.

9. ten gloves nail ____________ 9.

10. step sore shoes ____________ 10.

11. digest intestine growl ____________ 11.

12. shrill policeman dog ____________ 12.

13. traffic motor roads ____________ 13.

14. green cottage cracker ____________ 14.

GO ON TO THE NEXT PAGE

REMOTE CLASS COMPLETION

Find a fourth word that goes with all three.

15. top goat peak ____________ 15.

16. store string shine ____________ 16.

17. brains cabbage hunter ____________ 17.

18. Roman digits figures ____________ 18.

19. cottage dog building ____________ 19.

20. tin officer guard ____________ 20.

21. America eye hawk ____________ 21.

22. globe quake sky ____________ 22.

23. city sign pavement ____________ 23.

24. sea shaker eat ____________ 24.

25. corner inch dance ____________ 25.

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

SAME - OPPPOSITE

DIRECTIONS

There are two words in each question. For some of the questions the two words mean the same or about the same thing. For other questions the two words are opposite or about the opposite in meaning. You are to decide if the two words in each question mean the same thing or are opposite in meaning. Then,

Mark the T-box for Same.
Mark the F-box for Opposite.

Be sure to match the number of the question with the number of the row of answer boxes.

Let's look at two examples:

I. big - large

Look at the two words. Do they mean the same or the opposite? Yes, they mean about the same. The answer box below has been marked correctly.

I. ■ ☐ ☐ ☐ ☐

Example II. hot - cold

Do these words mean the same or the opposite? Yes, they mean about the opposite. The answer box below has been marked correctly.

II. ☐ ■ ☐ ☐ ☐

There are 20 questions on the test. Be sure to answer all of them.

If you have any questions, ask them now.

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SAME - OPPOSITE

Mark the T-box for SAME
Mark the F-box for OPPOSITE

1. glee . . . . joy
2. dull . . . . sharp
3. apiece . . . . each
4. peak . . . . valley
5. offer . . . . refuse
6. brief . . . . long
7. survive . . . . remain
8. flood . . . . drain
9. forbid . . . . allow
10. order . . . . arrange
11. trench . . . . ditch
12. single . . . . numerous
13. inquire . . . . ask
14. speckled . . . . spotted
15. expand . . . . compress
16. brace . . . . support
17. unseen . . . . visible
18. captive . . . . free
19. recipe . . . . formula
20. hastily . . . . leisurely

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

SCRAMBLED SENTENCES

DIRECTIONS

For each question there is a group of words that are scrambled or in a mixed up order. There are two steps to this test.

Step 1: You are to rearrange the words in your head to make a sentence.

Step 2: Then decide whether the sentence you made out of the scrambled words is true or false.

On the answer sheet, find the answer boxes numbered the same as the question you are working on. You will see a T and F above the first two boxes.

If the sentence is true, mark the T box.
If the sentence is false, mark the F box.

Here are two examples:

I. above grow ground flowers

The sentence above reads Flowers grow above ground when the words are unscrambled. Is this a true statement? Yes, this is true. The T or true box is marked correctly:

I. ■ ☐ ☐ ☐ ☐

II. trees in fish live

When we unscramble these words our sentence reads: Fish live in trees. Is this a true sentence? No, we know it is false because fish do not live in trees. The F or false box is marked correctly:

II. ☐ ■ ☐ ☐ ☐

There are 20 questions. They are about social studies, science, language arts, and mathematics. Answer all of them.

If you have any questions, ask them now.

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SCRAMBLED SENTENCES

In your head, unscramble the words below to make a sentence.
If the sentence is true, mark the T-box on your answer sheet.
If the sentence is false, mark the F-box on your answer sheet.

Social Studies

1. straight are waterways all
2. sky an flies ground in airplane the travels and the on
3. that south all mountain a begin rivers in flow
4. region near cold the tropical being equator the makes
5. Australia comes summer the during in Christmas

Science

6. climates in cold occur glaciers
7. to lungs use blooded mammals and warm are breathe
8. vegetables kinds invertebrates are of
9. neither mammals whales are nor crocodiles
10. both exist things solids as some liquids and

GO ON TO THE NEXT PAGE

SCRAMBLED SENTENCES

In your head, unscramble the words below to make a sentence.
If the sentence is true, mark the T-box on your answer sheet.
If the sentence is false, mark the F-box on your answer sheet.

Language Arts

11. are nouns always contractions

12. mark of one punctuation is period a type

13. mark ends in statement a question a

14. both verbs adverbs modify and adjectives

15. 'an form is word a shortened abbreviation a of

Mathematics

16. must curved all intersect lines

17. be a holder letter place can a

18. quotient the of divisor product a and the is dividerd

19. a multiplication is sign in times used

20. three plane a dimensions has

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

SEEING TRENDS

DIRECTIONS

For each question there are 4 words with 3 blank spaces between them on the left side of the page. There is also one word on the right. This word belongs in one of the blank spaces. When it is put in the correct space, the 5 words form a pattern. The pattern is based on the structure or form of the words. Do not pay attention to the meaning of the words.

You are to decide which blank space is the correct place for the word on the right. On the answer sheet, find the row of boxes numbered the same as the question you are working on. Fill in the answer box that has the same letter as the blank space you picked.

In the test there are several different types of patterns. Here are examples of two:

Example I: all ____ boy ____ cage ____ each (dot)
A B C

In which space does the word (dot) belong so that the 5 words form a pattern? The first letter of each word goes from "a" to "e" when (dot) is put in space C.

all ____ boy ____ cage (dot) each I, [A] [B] ■ [D] [E]
A B C

Example II: six ____ five ____ fifty ____ one (nine) II. [A] [B] ■ [D] [E]
A B C

The number of letters increases and then decreases again when (nine) is put in space C. The number of letters for each word is 3, 4, 5, 4, 3. The C-box is marked correctly above.

There are 20 questions. Answer all of them. Remember there are many different kinds of patterns.

If you have any questions, ask them now.

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SEEING TRENDS

In which blank does the word on the right belong?

1. a ____ on ____ coat ____ ready (ten)
A B C

2. hurt ____ joke ____ dear ____ barn (find)
A B C

3. arm ____ lean ____ ocean ____ extra (car)
A B C

4. mud ____ jar ____ day ____ air (get)
A B C

5. able ____ into ____ ouch ____ ugly (even)
A B C

6. broke ____ name ____ pretty ____ eat (her)
A B C

7. legal ____ not ____ an ____ I (such)
A B C

8. also ____ edge ____ girl ____ inch (coal)
A B C

9. unless ____ off ____ item ____ angry (eight)
A B C

10. blue ____ did ____ crowd ____ bit (clean)
A B C

GO ON TO THE NEXT PAGE

SEEING TRENDS

In which blank does the word on the right belong?

11. up ____ ice ____ elf ____ ask (own)
A B C

12. sweet ____ under ____ visit ____ world (train)
A B C

13. bell ____ hand ____ keep ____ name (else)
A B C

14. built ____ daisy ____ happy ____ judge (floor)
A B C

15. luck ____ king ____ just ____ bold (item)
A B C

16. cake ____ fish ____ iron ____ offer (lamp)
A B C

17. us ____ ran ____ dance ____ return (live)
A B C

18. that ____ sang ____ real ____ poor (quit)
A B C

19. away ____ ever ____ once ____ uncle (into)
A B C

20. pie ____ mop ____ apart ____ pile (spool)
A B C

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

SENSITIVITY TO ORDER

DIRECTIONS

There are four (4) words together in a line for each question. The spaces at the beginning of the line, between each word and at the end of the line have been lettered A,B,C,D, and E. One other word is given on the right. You are to decide in which blank the word on the right belongs--blank A,B,C,D, or E. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. Fill in the answer box on the answer sheet that has the same number as the blank you picked.

Here is an example:

I. ____Monday____Wednesday____Thursday____Friday____ (Tuesday) [A] ■ [C] [D] [E]
A B C D E

I.

Tuesday is the day after Monday and the day before Wednesday so it belongs in blank B. The B-box has been marked correctly above.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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SENSITIVITY TO ORDER

In which blank does the word on the right belong?

1. ____ seed ____ tree ____ blossom ____ apple ____ (bud)
A B C D E

2. ____ California ____ Colorado ____ Kansas ____ Kentucky ____ (Maryland)
A B C D E

3. ____ sponge ____ cork ____ steel ____ diamond ____ (wood)
A B C D E

4. ____ adult ____ child ____ toddler ____ infant ____ (teenager)
A B C D E

5. ____ desert ____ plain ____ prairie ____ jungle ____ (forest)
A B C D E

6. ____ lemon ____ apple ____ grapefruit ____ pumpkin ____ (cherry)
A B C D E

7. ____ fingers ____ palm ____ wrist ____ shoulder ____ (elbow)
A B C D E

8. ____ trillion ____ billion ____ thousand ____ hundred ____ (million)
A B C D E

9. ____ one-fifth ____ one-fourth ____ one-third ____ one-half ____ (one-sixth)
A B C D E

10. ____ word ____ sentence ____ chapter ____ story ____ (paragraph)
A B C D E

GO ON TO THE NEXT PAGE

SENSITIVITY TO ORDER

In which blank does the word on the right belong?

11. ____ barrel ____ gallon ____ quart ____ cup ____ (pint)
A B C D E

12. ____ match ____ lamp ____ searchlight ____ sun ____. (candle)
A B C D E

13. ____ pea ____ marble ____ golf ball ____ bowling ball ____ (baseball)
A B C D E

14. ____ wheelbarrow ____ tricycle ____ roller skate ____ train ____ (bicycle)
A B C D E

15. ____ lake ____ river ____ rapids ____ waterfall ____ (stream)
A B C D E

16. ____ shoes ____ pants ____ tie ____ hat ____ (shirt)
A B C D E

17. ____ nest ____ egg ____ chick ____ hen ____ (straw)
A B C D E

18. ____ ice cream ____ hot fudge ____ whipped cream ____ nuts ____ (cherry)
A B C D E

19. ____ snail ____ horse ____ automobile ____ airplane ____ (tricycle)
A B C D E

20. ____ write ____ read ____ perform ____ applause ____ (rehearse)
A B C D E

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

SENTENCE ORDER

DIRECTIONS

There are 20 groups of three sentences each. When the three sentences in each group are in the proper order they tell about something that happened. The three sentences of each group are not given in the right order. You must decide how to arrange the three sentences so that they are in the right order. Then you will be asked two questions for each group of 3 sentences:

1. Which sentence should come first?
2. Which sentence should come last?

Let's look at an example.

I. Which sentence below should come first? I. [A] ■ [C] ■ ■

II. Which sentence below should come last? II. [A] [B] ■ ■ ■

A. I bought some apples.
B. Mother sent me to the store.
C. I ate an apple on the way home.

What is the best way to arrange these sentences to make sense?

This is the best way:

B. Mother sent me to the store.
A. I bought some apples.
C. I ate an apple on the way home.

The answer boxes above have been marked correctly for the two questions about this group of sentences.

Do not make any marks in your test booklet. Rearrange the sentences in your mind and then answer the two questions about each group of sentences. There are 40 questions in all. Be sure to answer all of them.

If you have any questions, ask them now.

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SENTENCE ORDER

1. Which sentence below should come first?

2. Which sentence below should come last?

A. In a short time the fire was put out.
B. Mother called the fire department.
C. I opened the basement door, and smoke poured out.

3. Which sentence below should come first?

4. Which sentence below should come last?

A. We wrote a story about our trip.
B. Our class went on a bus to visit a bakery.
C. We watched the bakers remove cakes from the oven.

5. Which sentence below should come first?

6. Which sentence below should come last?

A. She worked hard all day.
B. She arrived at her office.
C. She ate dinner at home in the evening.

7. Which sentence below should come first?

8. Which sentence below should come last?

A. We each caught five fish.
B. We drove to the lake in the mountains.
C. We packed our fishing poles for our trip.

9. Which sentence below should come first?

10. Which sentence below should come last?

A. On the way home we laughed about the monkeys.
B. We went to the zoo last week.
C. The keeper told us about the animals.

GO ON TO THE NEXT PAGE

SENTENCE ORDER

11. Which sentence below should come first?

12. Which sentence below should come last?

A. Jane went to the grocery store.
B. The clerk gave Jane forty cents in change.
C. Jane paid the clerk a dollar.

13. Which sentence below should come first?

14. Which sentence below should come last?

A. We ate our orange slices.
B. Jim gave one piece to each of us.
C. Jim cut an orange into four pieces.

15. Which sentence below should come first?

16. Which sentence below should come last?

A. The teacher drew a circle.
B. Sue asked her teacher to draw a circle.
C. Sue made a picture out of the teacher's circle.

17. Which sentence below should come first?

18. Which sentence below should come last?

A. I had to pay a fine.
B. I did not finish the book in time.
C. I borrowed a book from the library.

19. Which sentence below should come first?

20. Which sentence below should come last?

A. We sold the cookies in front of a store.
B. Our club baked lots of cookies.
C. We made ten dollars.

GO ON TO THE NEXT PAGE

SENTENCE ORDER

21. Which sentence below should come first?

22. Which sentence below should come last?

A. My aunt gave us each a present when we left to go home.
B. We took the train to visit my aunt.
C. We stayed at my aunt's home for the weekend.

23. Which sentence below should come first?

24. Which sentence below should come last?

A. My friends and I went to the beach.
B. Everyone peeled but me.
C. We all got sunburned.

25. Which sentence below should come first?

26. Which sentence below should come last?

A. The story was printed in the paper.
B. Jim sent the story to the school newspaper.
C. Jim wrote a story in school.

27. Which sentence below should come first?

28. Which sentence below should come last?

A. The boys sailed their boats in the pond at the park.
B. Tom and Steve made paper boats.
C. The two boys took the boats to the park.

29. Which sentence below should come first?

30. Which sentence below should come last?

A. John hurt his foot.
B. John fell on the ice.
C. John borrowed some ice skates.

GO ON TO THE NEXT PAGE

SENTENCE ORDER

31. Which sentence below should come first?

32. Which sentence below should come last?

A. The doorbell rang.
B. My uncle came inside.
C. Father went to open the door.

33. Which sentence below should come first?

34. Which sentence below should come last?

A. The stewardess told us to fasten our seat belts.
B. My sister and I climbed aboard the jet.
C. We took off.

35. Which sentence below should come first?

36. Which sentence below should come last?

A. Columbus reached the Americas in October.
B. Columbus named the natives "Indians."
C. Columbus left Spain for the Orient.

37. Which sentence below should come first?

38. Which sentence below should come last?

A. The medicine man grinds stones to get colored sand.
B. The sand paintings are destroyed after the ceremony.
C. The medicine man uses the colored sand to make sand paintings for special ceremonies.

39. Which sentence below should come first?

40. Which sentence below should come last?

A. The salmon swims upstream to lay its eggs.
B. The salmon spends its adult life in the sea.
C. Pacific salmon die soon after laying their eggs.

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

VERBAL ANALOGIES

DIRECTIONS

We sometimes say that two words are "related" when there is some kind of connection between them. For example, they may be alike or different in some way. In each question below, there are three words given in capital letters. Look at the first two words and figure out how they are related. Then, choose the one answer that is related to the third word in the same way that the second word is related to the first. On the answer sheet mark the box with the letter of your answer.

Here is an example:

I. HAND is to MAN as PAW is to
A. boy
B. dog
C. fish
D. bird

I. [A] ▮ [C] [D] [E]

Look at the first two words. How are they related? HAND is a part of a MAN's body. Which answer is related to PAW in the same way that MAN is related to HAND? The correct answer is DOG. PAW is a part of a DOG's body. The letter is B. The correct box has been marked above.

Remember, words may be related in many different ways. Be sure to look at each question carefully.

There are 24 questions. Answer all of them.

If you have any questions, ask them now.

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VERBAL ANALOGIES

1. SHIP is to DOCK as AUTOMOBILE is to

A. garage
B. road
C. fender
D. mechanic

2. LETTERS is to MAILBOX as MONEY is to

A. bank
B. spend
C. coins
D. wealth

3. PIG is to PORK as STEER is to

A. car
B. ranch
C. beef
D. cowboy

4. TASTE is to TONGUE as TOUCH is to

A. finger
B. eye
C. feeling
D. borrow

5. NOTHING is to EVERYTHING as WHISPER is to

A. mystery
B. yell
C. voice
D. ghost

6. WOOD is to DECAY as IRON is to

A. dampness
B. rust
C. steel
D. ore

7. NUT is to SHELL as PEA is to

A. shooter
B. soup
C. green
D. pod

8. MELON is to RIND as ANIMAL is to

A. skin
B. horn
C. fox
D. cage

GO ON TO THE NEXT PAGE

VERBAL ANALOGIES

9. PARACHUTE is to PLANE as LIFE PRESERVER is to
A. fish
B. boat
C. water
D. chest

10. HAND is to ELBOW as FOOT is to
A. muscle
B. knee
C. leg
D. toe

11. NECKLACE is to BEAD as CHAIN is to
A. ball
B. iron
C. link
D. strength

12. SHOWER is to CLOUDBURST as BREEZE is to
A. rain
B. sunshine
C. climate
D. tornado

13. SORROW is to DEATH as HAPPINESS is to
A. accident
B. smiling
C. crying
D. birth

14. COMMON is to STEEL as RARE is to
A. steak
B. crowd
C. humor
D. diamond

15. THROW is to BALL as CHEW is to
A. teeth
B. food
C. nose
D. milk

16. FLY is to SPIDER as MOUSE is to
A. cat
B. rat
C. rodent
D. animal

GO ON TO THE NEXT PAGE

VERBAL ANALOGIES

17. SEAL is to FISH as BIRD is to
A. wing
B. feather
C. worm
D. snail

18. SEA is to COAST as RIVER is to
A. inlet
B. delta
C. stream
D. bank

19. TUESDAY is to THURSDAY as SATURDAY is to
A. Sunday
B. Monday
C. Wednesday
D. Friday

20. HEAR is to SOUND as SEE is to
A. move
B. taste
C. scene
D. eye

21. MOTORCYCLE is to BICYCLE as AUTOMOBILE is to
A. bus
B. airplane
C. transportation
D. wagon

22. BUD is to BLOSSOM as BLOSSOM is to
A. fruit
B. leaf
C. vine
D. flower

23. ACORN is to OAK as EGG is to
A. yolk
B. crack
C. bird
D. shell

24. VINE is to WATERMELON as TREE is to
A. limb
B. leaf
C. apple
D. earth

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

VERBAL CLASSIFICATION

DIRECTIONS

Each question has four (4) words in the left column that belong together. They form a class based upon meaning. There are three (3) words on the right that are possible answers. You are to pick the one answer that belongs with the four words on the left. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. You are to fill in the answer box on the answer sheet that has the same letter as the answer you picked.

Here is an example:

I.	steak	A. egg	I. ■ [b] [c] [d] [e]
	milk	B. knife	
	orange	C. dish	
	onion		

How are the four words on the left alike? They are all foods. Which one word on the right is like them? B. knife and C. dish are not foods. A. egg is a food. Its letter is A. The A-box is marked correctly above.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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VERBAL CLASSIFICATION

Which word on the right belongs with the group on the left?

1.	dirt	A.	steel
	gravel	B.	wood
	macadam	C.	concrete
	asphalt		
2.	ice	A.	storm
	water	B.	snow
	sleet	C.	wind
	rain		
3.	stream	A.	bank
	lake	B.	brook
	creek	C.	ocean
	river		
4.	ant	A.	flea
	bee	B.	spider
	tick	C.	worm
	beetle		
5.	puppy	A.	hen
	colt	B.	sheep
	chick	C.	kitten
	lamb		
6.	cloves	A.	radish
	garlic	B.	pepper
	cinnamon	C.	flour
	salt		
7.	crack	A.	open
	shatter	B.	mend
	tear	C.	break
	rip		
8.	basketball	A.	ice hockey
	volleyball	B.	archery
	baseball	C.	soccer
	football		
9.	boulder	A.	stone
	gravel	B.	lake
	pebble	C.	desert
	rock		
10.	paste	A.	cut
	sew	B.	house
	build	C.	tape
	cement		

GO ON TO THE NEXT PAGE

VERBAL CLASSIFICATION

Which word on the right belongs with the group on the left?

11.	alone	A. person
	only	B. both
	sole	C. single
	unique	
12.	noun	A. paragraph
	verb	B. adverb
	conjunction	C. punctuation
	adjective	
13.	bark	A. honk
	quack	B. crash
	peep	C. ring
	roar	
14.	month	A. degree
	year	B. third
	minute	C. second
	week	
15.	over	A. start
	again	B. repeat
	another	C. end
	duplicate	
16.	hunt	A. seek
	look	B. find
	search	C. view
	scout	
17.	lantern	A. flashlight
	candle	B. thunder
	sun	C. clouds
	light bulb	
18.	mittens	A. blouse
	muffler	B. tennis shoes
	boots	C. sweater
	overcoat	
19.	poppy	A. pine
	pansy	B. orchid
	lily	C. bamboo
	lotus	
20.	spill	A. pour
	drip	B. leak
	seep	C. crack
	overflow	

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

VERBAL EXCLUSION

DIRECTIONS

There are four (4) words for each question. Three (3) of these words belong together. They form a class based upon meaning. One word does not belong to this class. You are to pick the word that does not belong. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. You are to fill in the answer box on the answer sheet that has the same letter as the answer you picked.

Here is an example:

1. A. Sunday B. Thursday C. Yesterday D. Wednesday

I. [A] [B] ■ [D] [E]

Three of these belong to a class. Which word does not belong? A. Sunday, B. Thursday, and D. Wednesday are all names of the days of the week. C. Yesterday is not. Its letter is C. The C-box is marked correctly above.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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VERBAL EXCLUSION

Which word does not belong?

1. A. ounce B. pound C. ton D. acre

2. A. beef B. heart C. stomach D. liver

3. A. flute B. harmonica C. sing D. bugle

4. A. tennis B. dance C. golf D. badminton

5. A. cement B. water C. vinegar D. gasoline

6. A. strawberry B. plum C. peach D. apple

7. A. blizzard B. tornado C. hurricane D. earthquake

8. A. couple B. several C. both D. pair

9. A. tape B. sew C. cut D. build

10. A. puppy B. chick C. lamb D. hen

GO ON TO THE NEXT PAGE

VERBAL EXCLUSION

Which word does not belong?

11. A. almond B. cashew C. fudge D. pecan

12. A. bee B. spider C. moth D. wasp

13. A. again B. over C. start D. repeat

14. A. drip B. leak C. spill D. pour

15. A. garage B. wrench C. pliers D. screwdriver

16. A. on B. and C. over D. to

17. A. pliers B. shears C. scissors D. nutcracker

18. A. crack B. mend C. break D. shatter

19. A. find B. hunt C. look D. search

20. A. lake B. street C. canyon D. river

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

WORD EXCLUSION

DIRECTIONS

There are four (4) words for each question. Three (3) of these words belong together. They form a class based upon the structure or form of the words. The meaning of the words is not important. One word does not belong to this class. You are to pick the word that does not belong. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. You are to fill in the answer box on the answer sheet that has the same letter as the answer you picked.

Here is an example:

I. A. thought B. tot C. twirl D. that

I. [a] [b] ■ [d] [e]

Three of these belong to a class. Which word does not belong? A. thought, B. tot, and D. that all begin and end with the letter t. C. twirl does not. Its letter is C. The C-box is marked correctly above.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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WORD EXCLUSION

Which word does not belong?

1. A. mist B. mind C. mart D. mint

2. A. on B. up C. as D. to

3. A. cool B. took C. tool D. wool

4. A. rat B. sip C. arm D. log

5. A. trap B. trim C. trot D. tree

6. A. beak B. week C. meet D. feed

7. A. classify B. paste C. trespass D. essay

8. A. ghost B. twig C. high D. tough

9. A. lapel B. level C. label D. loyal

10. A. veil B. neighbor C. field D. weigh

11. A. flood B. fellow C. flaw D. few

12. A. quit B. quite C. quill D. quick

13. A. leash B. bashful C. short D. ashore

14. A. riddle B. roller C. fall D. tossed

15. A. shackle B. cracker C. slack D. brick

16. A. floor B. first C. farther D. fair

17. A. chrome B. couple C. cackle D. cycle

GO ON TO THE NEXT PAGE

WORD EXCLUSION

Which word does not belong?

18. A. hair B. wait C. laid D. bias

19. A. stack B. those C. thistle D. astride

20. A. tender B. candle C. land D. meander

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

WORD GROUP NAMING

DIRECTIONS

In each question there are 4 words on the left which are alike in some way. In the blank space in your booklet you are to print (or write clearly) the best general name for the group of words. Be as specific as possible.

Here is an example:

I. poodle
terrier
hound are all ______________________
collie

Poodle, terrier, hound and collie are all animals, but the best (most specific) name for the group is dogs. You should have written "dogs" on the line.

There are 20 questions. Be sure to answer all of them.

If you have any questions, ask them now.

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WORD GROUP NAMING

1. ant are all ____________
bee
fly
beetle

2. goblet are all ____________
mug
teacup
glass

3. football are all ____________
bat
tennis racket
golf club

4. pin are all ____________
staple
tack
zipper

5. leaf are all ____________
twig
trunk
root

6. barrel are all ____________
bathtub
purse
watering can

7. baby are all ____________
chick
colt
puppy

8. fairy are all ____________
genie
elf
mermaid

GO ON TO THE NEXT PAGE

WORD GROUP NAMING

9. blimp are all ____________
spaceship
plane
balloon

10. lawn mower are all ____________
hoe
rake
spade

11. tepee are all ____________
nest
beehive
igloo

12. scissors are all ____________
knife
razor blade
saw

13. thermometer are all ____________
ruler
scales
speedometer

14. mouth are all ____________
nose
ear
eye

15. ice are all ____________
steam
raindrop
snowflakes

16. newspaper are all ____________
TV
radio
telephone

GO ON TO THE NEXT PAGE

WORD GROUP NAMING

17. cow are all ____________
pig
chicken
horse

18. cane are all ____________
kiss
bar
lollipop

19. turkey are all ____________
penguin
duck
ostrich

20. hoof are all ____________
paw
foot
flipper

STOP

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS TEST

WORD GROUPS

DIRECTIONS

There are four (4) words on the left for each question. They are alike in some way in their structure or form. The meaning of the words has nothing to do with the way they are alike. There are three possible answers on the right. You are to decide which one of the three (3) possible answers has the same form as the words on the left. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. Fill in the answer box on the answer sheet that has the same letter as the answer you picked. Remember to pay attention to only the structure of form of the words.

Here is an example:

I.	ran	A. fat
	man	B. fan
	can	C. cat
	tan	

I. [A] ■ [C] [D] [E]

How are the four words on the left alike?
They all end in an. Which word - fat, fan, or cat - is like the four words on the left?

A. fat and C. cat do not end in an.
B. fan does end in an.

The answer is B. fan. Its letter is B. The B-box is marked correctly above.

There are 20 questions. Answer all of them. There are many different ways the groups of words can be alike.

If you have any questions, ask them now.

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WORD GROUPS

Which word on the right belongs with the group on the left?

1. on
it
as
up

A. to
B. am
C. no

2. fool
cool
tool
wool

A. took
B. coon
C. pool

3. rat
sip
bed
log

A. hum
B. arm
C. eye

4. mist
mast
mart
mint

A. malt
B. dart
C. mind

5. trap
trim
trot
tree

A. teen
B. tear
C. true

6. classify
boss
trespass
kiss

A. paste
B. essay
C. busy

7. ghost
high
aghast
tough

A. ghetto
B. twig
C. hang

8. vein
weigh
freight
neighbor

A. field
B. sieve
C. veil

9. flaw
follow
few
fellow

A. flood
B. flow
C. felled

10. quart
quill
quote
quick

A. quite
B. quit
C. trick

GO ON TO THE NEXT PAGE

WORD GROUPS

Which word on the right belongs with the group on the left?

11.	seven	A.	level
	never	B.	devil
	bevel	C.	beaver
	fever		
12.	riddle	A.	role
	tossed	B.	free
	swelling	C.	burrow
	roller		
13.	furlough	A.	huge
	trough	B.	dough
	bough	C.	eight
	enough		
14.	shackle	A.	trace
	track	B.	brick
	cracker	C.	slack
	back		
15.	floor	A.	fear
	fair	B.	feed
	for	C.	first
	farther		
16.	bat	A.	bin
	rot	B.	cut
	sit	C.	sod
	get		
17.	cycle	A.	create
	cackle	B.	chrome
	chuckle	C.	couple
	cradle		
18.	flood	A.	doom
	door	B.	lot
	look	C.	rode
	stool		
19.	steer	A.	those
	first	B.	sift
	thistle	C.	stack
	astride		
20.	hair	A.	bias
	wait	B.	main
	laid	C.	dial
	bail		

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

WORD LINKAGE

DIRECTIONS

For each question there are two (2) words on the left and three (3) possible answers on the right. You are to pick the answer that is related in meaning to both of the words on the left. On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. You are to fill in the answer box on the answer sheet that has the same letter as the answer you picked.

Here is an example:

I. airplane - insect
A. fly
B. passenger
C. bug

I. ■ ☐ ☐ ■ ■

Airplane and insect are not related to each other. However, insect is related to bug and to fly, and airplane is related to fly and to passenger.

Fly is the only answer that is related to both words airplane and insect. The letter for fly is A. The A-box is marked correctly above.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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WORD LINKAGE

Which of the three words on the right is related in meaning to both words on the left?

1. wander - snow
   A. cold
   B. walk
   C. drift

2. foot - hit
   A. shoe
   B. slap
   C. sock

3. quiet - yet
   A. still
   B. silent
   C. now

4. palm - appointment
   A. date
   B. time
   C. hand

5. fungus - shape
   A. form
   B. mold
   C. decay

6. fence - write
   A. cage
   B. pen
   C. paper

7. horse - delay
   A. stall
   B. relay
   C. race

8. pucker - handbag
   A. pocketbook
   B. purse
   C. kiss

9. season - coil
   A. spring
   B. wire
   C. fall

10. bend - thin
    A. skinny
    B. lean
    C. curve

GO ON TO THE NEXT PAGE

WORD LINKAGE

Which of the three words on the right is related in meaning to both words on the left?

11. finger - hammer
A. toe
B. pliers
C. nail

12. pole - mail
A. post
B. letter
C. telephone

13. weaken - juice
A. sap
B. fluid
C. tire

14. bull - car
A. horn
B. transportation
C. animal

15. copy - scant
A. little
B. trace
C. imitate

16. texture - seed
A. rough
B. plant
C. grain

17. shoot - burn
A. flame
B. fire
C. gun

18. occupation - barter
A. exchange
B. job
C. trade

19. woo - palace
A. court
B. love
C. king

20. seat - drink
A. sip
B. chair
C. lap

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

WORD RELATIONS

DIRECTIONS

Each question has five (5) words and a blank space in 3 pairs on the left. The first two pairs of words show a pattern in the structure or form of the words. These patterns have nothing to do with the meaning of the words. You are to discover the pattern of the first two pairs of words. One word is missing from the third pair where the blank space is. You are to pick the one word from the list of possible answers on the right that fits this pattern and belongs in the blank space.
On the answer sheet, find the row of answer boxes numbered the same as the question you are working on. Look at the letter that goes with your answer. Fill in the box on the answer sheet that has the same letter as your answer. Remember to pay attention only to the structure or form of the words.

There are several different patterns in the test. Here is one example:

I. top - pot
A. pet
B. tat
tip - pit
C. part
D. put
tap - ___
E. pat

I. [A] [B] [C] [D] ■

Look at the first two pairs of words on the left. Can you discover the pattern?

The pattern is that for the second word of each pair, the letters of the first word have been reversed; t o p goes to p o t and t i p goes to p i t.

Now look at the fifth word on the left. Which word on the right fits in the blank? Remember, it must follow the pattern. Reverse the letters of the fifth word, t a p to get p a t. Where is pat in the list on the right? Its letter is E. The E-box has been marked correctly above.

There are 20 questions. Answer all of them.

If you have any questions, ask them now.

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WORD RELATIONS

Which of the words on the right belongs in the blank space?

1\.
ram - ream
star - stear
cram - _____

A. rear
B. cream
C. cramp
D. creak
E. start

2\.
pear - reap
deal - lead
read - _____

A. dear
B. real
C. dead
D. rear
E. peat

3\.
twist - wise
frost - rose
twirl - _____

A. twig
B. tire
C. wile
D. worm
E. wire

4\.
create - crate
emit - mit
feed - _____

A. fed
B. fit
C. feet
D. feel
E. deaf

5\.
seat - heat
seal - heal
sear - _____

A. heap
B. hear
C. seal
D. seam
E. heed

GO ON TO THE NEXT PAGE

WORD RELATIONS

Which of the words on the right belongs in the blank space?

6. battle - bale
middle - mile
fizzle - _____

A. bile
B. male
C. fail
D. file
E. fine

7. maid - dial
feud - duel
bias - _____

A. bail
B. base
C. said
D. sale
E. sail

8. knot - not
like - lie
stark - _____

A. mark
B. stack
C. star
D. ark
E. stay

9. dirt - ride
fast - safe
lurk - _____

A. rule
B. luck
C. curl
D. lure
E. rust

10. car - race
mat - tame
mit - _____

A. tame
B. care
C. time
D. mite
E. mire

GO ON TO THE NEXT PAGE

WORD RELATIONS

Which of the words on the right belongs in the blank space?

11. feet - fat

beet - bat

meet - _____

A. met
B. beat
C. team
D. mat
E. mit

12. stamp - tame

stilt - tile

shirt - _____

A. short
B. dirt
C. tire
D. hint
E. hire

13. retool - looter

lever - revel

reward - _____

A. reveal
B. drawing
C. warden
D. drawer
E. reword

14. reel - rat

feel - fat

peel - _____

A. par
B. pat
C. peg
D. peer
E. fell

15. mit - mist

bet - beat

hay - _____

A. hat
B. heat
C. bay
D. hazy
E. may

GO ON TO THE NEXT PAGE

WORD RELATIONS

Which of the words on the right belongs in the blank space?

16. paddle - pale
muddle - mule
dazzle - _____

A. dial
B. daze
C. deal
D. lead
E. dale

17. meat - tame
veil - live
deaf - _____

A. fare
B. fame
C. fade
D. deal
E. leaf

18. taps - spat
tang - gnat
flow - _____

A. flat
B. flap
C. wolf
D. worm
E. loft

19. lead - bead
lean - bean
leak - _____

A. beak
B. lean
C. leer
D. bake
E. keel

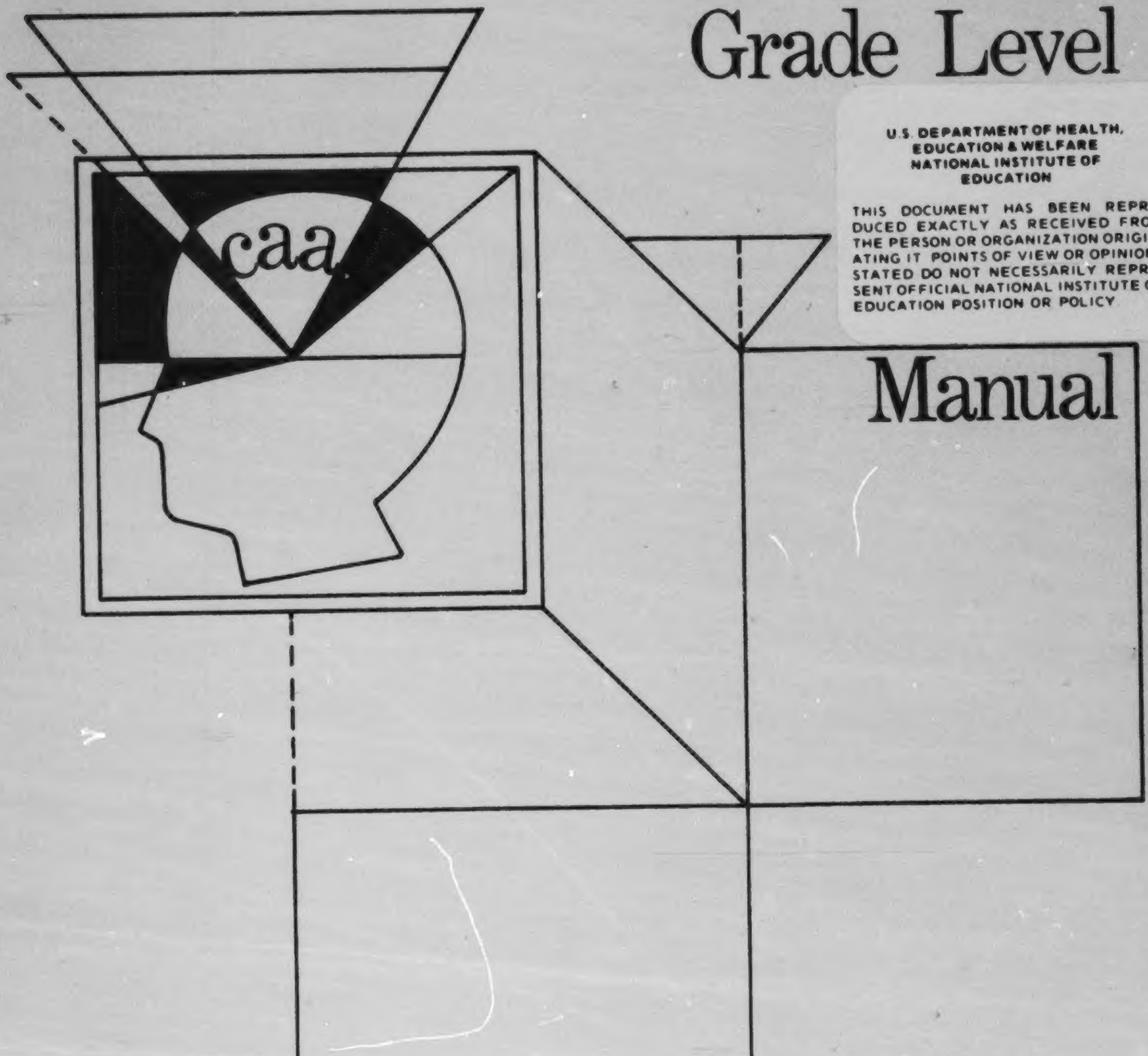
20. snap - pans
golf - flog
time - _____

A. mite
B. emit
C. tame
D. taps
E. edit

STOP

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST

Instruments for Measuring Cognitive Abilities at the Intermediate Grade Level



Manual

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Instruments for Measuring Cognitive Abilities at the Intermediate Grade Level

Manual

Margaret L. Harris

Chester W. Harris
University of California, Santa Barbara

Wisconsin Research & Development Center
for Cognitive Learning

Madison, Wisconsin

141

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NOTE TO USERS

Copyrights on the tests in this packet were secured to protect the works during a period in which additional refinement of the instruments may occur and to insure that data from subsequent studies are available to the developer. The refinement process may include compiling norms for other grade levels, types of school districts, etc.; confirming, expanding, or refuting conclusions about the ability best measured by a particular test; and locating weaknesses in the tests. By monitoring the use of these instruments, the R & D Center will be able to assist in the exchange of information among researchers.

Requests for permission to reproduce the tests should be sent, with a description of the proposed study, to the Coordinator of Test Development at the Center. It is anticipated that all research requests will be granted, with the stipulation that data collected (item and total score statistics, correlations of the tests with each other, etc.) will be sent to the Center. The intent is to broaden the impact rather than restrict the use of these instruments.

TABLE OF CONTENTS

Page

Note to Users iii

List of Tables vii

I. Introduction 1

Overview of the Project 3

II. Construct Validity 9

Summary of Test Development 9
Test Construction: Content Validity 10
Test Revision 12

Summary of Cognitive Abilities Factors 12

III. Functioning of the Tests 15

Subjects 15
Test Administration 16
Reliability Estimates and Normative Data 18
Item Indices 24

IV. Description of and Ability Best Measured by Each Test . 31

V. Scoring Keys 45

References 57

LIST OF TABLES

Table		Page
I.1	Chronology: Project on Structure of Concept Attainment Abilities	4
II.1	Summary of Cognitive Abilities Factors	13
III.1	Number of Items and Administration Time for Each Test	17
III.2	Means, Standard Deviations, Reliability Estimates, and Standard Errors of Measurement: 1970 Boys and Girls	19
III.3	Source of Each Test and Number of Choices for Each Item	20
III.4	Order of Administration of 56 Tests	22
III.5	Means, Standard Deviations, Reliability Estimates, and Standard Errors of Measurement: 1971 Boys and Girls	23
III.6	Order of Administration of 31 Tests	24
III.7	Item Indices: 1970 Boys and Girls	25
III.8	Item Indices: 1971 Boys and Girls	27
IV.1	Tests Categorized as Measures of Ten Abilities	32

I

Introduction

The packet, *Instruments for Measuring Cognitive Abilities at the Intermediate Grade Level,* comprising this manual and a copy of each of 37 tests designed to measure cognitive abilities at the intermediate grade level, is intended to accompany the monograph, A Structure of Concept Attainment Abilities (Harris & Harris, 1973). The purpose of this packet is to make the tests available to those persons who wish tests of various cognitive abilities that are appropriate for the intermediate grade level. The tests included are:

- Best Word Class
- Circle Reasoning
- Class Name Selection
- Concealed Letters
- Concealed Words
- Disemvowelled Words
- Gestalt Completion
- Letter Classification
- Letter Grouping
- Letter Triangle
- Number Class Extension
- Number Classification
- Number Exclusion
- Number Relations
- Number Series
- Omelet
- Picture Class Memory
- Picture Classification
- Picture Exclusion
- Picture Group Name Selection
- Picture Group Naming
- Remembering Classes: Members
- Remembering Classes: Names
- Remote Class Completion
- Same-Opposite
- Scrambled Sentences
- Seeing Trends
- Sensitivity to Order
- Sentence Order
- Verbal Analogies
- Verbal Classification
- Verbal Exclusion
- Word Exclusion
- Word Group Naming
- Word Groups
- Word Linkage
- Word Relations

The monograph and the manual also include information about 19 other tests that are available from other test publishers. The complete set of tests--the 37 listed above plus the 19 other tests--provides measures of 7, and perhaps 10, distinctive cognitive abilities.

This manual is meant to be a supplement to the monograph. It will not present information in such detail as does the monograph. For example, validity, reliability, and norming information are discussed quite extensively in the monograph; there seems to be no need to repeat these in detail. However, we do include in this manual tables giving the means, standard deviations, and reliability estimates of each test for four different samples; these tables also include the standard errors of measurement. The manual contains a summary of the monograph, including a summary of the findings from the factorial study of the two batteries of cognitive abilities tests as administered to two different samples each. A main section of the manual gives a description of the tests, along with the ability best measured by each as determined from our results. The manual also includes the scoring key for each of the 37 tests included in the packet and other pertinent information that was not included in the monograph.

The monograph is the main source of information about two studies: a battery of 56 tests administered to two different samples was studied first; based upon the results of this study, a battery consisting of 31 tests was then studied. The monograph contains, in addition, preliminary and replicative studies of concept attainment measures, and a study of the relationships between the two types of measures. Previous publications which were partially incorporated into the monograph and/or into this manual contain reports on the development of the test batteries and the study of the 56-test battery conducted first. Cognitive abilities are defined and the selection of tests to measure them is described in Three Systems of Classifying Cognitive Abilities as Bases for Reference Tests (Harris & Harris, 1971e). A description of the procedures for constructing some of the tests implied by the systems examined, and summary item and test statistics for all of the tests in the 56-test battery as administered to two different samples are reported in Item Analyses and Reliabilities for Reference Tests for Cognitive Abilities: Fifth Grade Boys and Girls (Harris & Harris, 1971c). The empirical study of the interrelations of the 56 tests in the first battery is reported in Analysis of Dimensions of a Battery of Reference Tests for Cognitive Abilities: Fifth Grade Boys and Girls (Harris & Harris, 1971b). Thirty-five of the 37 tests included in this packet were previously published in Newly Constructed Reference Tests for Cognitive Abilities (Harris & Harris, 1971d).

Thirty-four of the 37 tests included in the packet of materials are copyrighted by the Wisconsin Research and Development Center for Cognitive Learning; one of these, Remote Class Completion, was adapted from the unpublished Warren and Davis Distant Linking Exam (WADDLE) (Warren & Davis, 1970) and is included here with the permission of the author[1] for the purpose of making this test readily available for use. Two of the tests, Concealed Words and Gestalt Completion, include some items that were taken from the tests of the same names copyrighted by ETS; we used these with permission for research purposes. We adapted these two tests, instead of using the ETS tests as they were, to make them more appropriate for the intermediate grade level. The items used in the Verbal Analogies test were taken from Gruber (1967) and reproduced by us for research purposes with the permission of the publisher. We selected the items to be used in the tryout and final versions of the test from the many given by Gruber.

Seven of the 37 tests included in this packet must be hand scored; the remaining ones may be machine scored. The directions given with the machine-scorable tests were written for using machine scoring with

---

[1] Thomas F. Warren, Beloit College.

Digitek equipment; they can readily be modified for use with other types of equipment or for hand scoring. Standard five-space (for letters) or seven-space (for numbers) Digitek answer sheets were used. When fewer than this number of choices were available for a particular test, the extra answer boxes were covered with small dots to blot them out to help the subjects remember that they were not possible answer choices. This was found to work very well. The tests that need to be hand scored provide space for responses in the test booklet itself rather than require an answer sheet. The machine-scorable tests can readily be adapted for hand scoring by having the subjects circle in the booklet the letter or number of their answer choice. The answer keys for all 37 tests can be found in Section V of this manual.

We were guided in the preparation of this manual by "Standards for Development and Use of Educational and Psychological Tests: Third Draft" (APA, 1973) and "Suggested Standards for Children's Samples" (White & Duker, 1973).

OVERVIEW OF THE PROJECT

An overview of the Concept Attainment Abilities (CAA) project, of which the development and study of the cognitive abilities test batteries was a part, is presented here.

This project began at the Wisconsin Research and Development Center for Cognitive Learning in 1969. The Center's earlier work in concept attainment and its commitment to improving elementary-school learning posed questions which the study was designed to answer:

1. How is concept attainment in one subject matter related to concept attainment in others?
2. What are the relationships between concept learning in the various school subjects and basic cognitive abilities?

Clearly the questions call for measurement both of concept attainment and of cognitive abilities.

Table I.1 gives an overview of the project. Definition, test development, and preliminary data collection were carried out separately for the two domains of interest, and only at the last stage were the two empirically related.

The first task was to delimit the scope of the project, both in terms of the target group and the conceptual framework of the study. While the project staff hoped to explore the subject matter and ability relationships at several age/grade levels, resource limitations suggested that we focus on a single group. Because of the Center's then impending curriculum-development efforts in the middle grades of the elementary school and because of the nature of the testing involved, the study was planned to utilize fourth graders and to deal with the content studied in fourth grade. In the course of pilot studies on the concept attainment tests it was learned that concepts presented in

Table I.1

Chronology: Project on Structure of Concept Attainment Abilities

<table>
<tr><th>Phase and Time</th><th>Subject Matters (Mathematics, Social Studies, Science, and Language Arts)</th><th>Cognitive Abilities</th></tr>
<tr><td>Definition
1969</td><td>--Identify three areas for study in each subject
--Identify concepts in these areas in fourth-grade texts
--Sample ten concepts in each area
--Analyze concepts</td><td>--Examine existing systems of cognitive abilities
--Select factors likely to be related to concept learning
--Identify or specify at least two measures for each factor in each system</td></tr>
<tr><td>Test Development
1969-70</td><td>--Develop 12 items for each concept
--Pilot and revise tests in light of item and test statistics
--Carry out validity and readability studies</td><td>--Adapt or develop new measures
--Pilot and revise tests in light of item and test statistics</td></tr>
<tr><td>Preliminary Data Collection
1970
200 boys
200 girls</td><td>--Administer tests in each subject matter to sample
--Analyze to determine factors within subject matter by concepts and by tasks
--Select concepts for further testing</td><td>--Administer all tests to sample
--Analyze to determine factors
--Select cognitive abilities tests for further testing</td></tr>
<tr><td>Final Data Collection
1971
204 boys
204 girls</td><td colspan="2">--Administer both batteries
--Analyze for interrelationships between cognitive abilities and concept items</td></tr>
<tr><td></td><td>--Compare factor structure of 1970 and 1971 data for each subject matter seperately
--Analyze for combined subject matters</td><td>--Compare factor structure of 1970 and 1971 cognitive abilities data</td></tr>
</table>

fourth-grade texts were difficult for the pupils using these books, even toward the end of the school year, and it was decided to substitute fifth graders in all stages of data collection.

Further delimitation was obtained by focusing only on concepts of a classificatory nature. Here a concept is a noun naming the category into which objects and events are placed on the basis of their criterial attributes. These characteristics or attributes common to all objects or events sharing the concept label define the concept.

There was a practical limit to the number of concepts at the fourth-grade level that could be utilized. Four subject matters--language arts, mathematics, science, and social studies--were selected, and within each subject matter three subareas were arbitrarily selected by the four principal investigators, who were subject-matter specialists. Then a variety of texts, including those used in fourth grade in the Madison, Wisconsin, public schools, was searched for classificatory concepts in these areas. Next, within each subarea ten concepts were randomly selected for inclusion in the study. Thus, 30 concepts were selected for each subject matter.

Each concept was analyzed in terms of its attributes, examples and nonexamples, and its relation to other concepts which might be supraordinate, coordinate, or subordinate to the target concept. Also, a definition in language thought understandable to intermediate-grade children was identified or developed for each concept.

Knowledge of the definition and of attributes, examples, and relationships was relevant to determining a student's level of attainment of a concept. Accordingly, a test for each concept was devised utilizing a schema for testing concept attainment that had been developed previously by Frayer, Fredrick, and Klausmeier (1969). Generally, one multiple-choice item was developed for each of 12 tasks, resulting in a 12-item test for each concept. The complete set of tests for a subject matter was thus comprised of 360 items, one for each cell in the 30 (concepts) by 12 (tasks) matrix. Individual scores can be totaled for tasks as well as concepts and subtotals for each subarea can be calculated. This became important in fitting the data to the programs used to analyze the data.

Tests were tried out on at least 100 fourth- or fifth-grade children, and the item and test characteristics were studied both in terms of concepts and tasks. Criteria were set in terms of item difficulty, item discrimination, and test reliability; one or more iterations of the develop-tryout sequence were undertaken so that tests would meet those standards. Readability, content validity, and construct validity were studied empirically, and procedures to ensure test quality in these aspects were formulated.

Finally, data were collected for each subject matter from about 400 children in the summer of 1970. Two different samples of boys and of girls participated in the testing for the four subject matters. No attempt was made to relate the data from one subject matter to that from another. Rather, alternative factor structures, varying from general to specific, were hypothesized both for concepts and for tasks within each subject matter. Data were then factor analyzed separately for boys and girls using three initial factor methods--Alpha (Kaiser &

Caffrey, 1965), Unrestricted Maximum Likelihood (UMLFA) (Jöreskog, 1967), and Harris R-S^2 (Harris, 1962). Orthogonal and oblique solutions were secured for each initial solution. Although interpretation led to the conclusion that a single common factor existed among the 30 concepts in each subject matter, the Harris R-S^2 analyses yielded more specific results, so at least two concepts with the highest coefficients on each of the Harris R-S^2 oblique common factors for both the boys and girls were selected for inclusion in the final (1971) study. Thus the most specific results were used to design the subsequent study to permit relationships across subject matters and with cognitive abilities to be maximally demonstrated. These 1970 analyses were repeated on the concept data for each subject matter in 1971 to see whether the findings held. Additionally, in 1970 three-mode factor analyses were performed, and in 1971 analyses across subject matters were done.

The set of activities carried out with respect to cognitive abilities was similar to that for concept attainment. The definition phase of the cognitive abilities project began with examination of three systems of cognitive abilities. The systems of Guilford, Guttman, and Thurstone are well known. The aspects of each system which seemed most related to concept attainment were identified. From Guilford's Structure-of-Intellect model the operation "cognition" was of primary interest, so tests of cognition of semantic, symbolic, and figural units, classes, relations, and systems were needed. Tests referenced to operations other than cognition were required for semantic classes. From Guttman's Facet Design the tasks of rule-inferring and rule-applying for the three contents--verbal, numerical, and pictorial--were of greatest interest. All of the seven clear factors in the Thurstones' Primary Mental Abilities were represented in the study, as well as two less clear factors. A fourth schema, restricted to explaining abilities to cognize concepts, was proposed; called Cognition of Concepts, it has three dimensions--content, task, and nature of exemplars. Most noteworthy is the expansion of kinds of content over that suggested in the other models.

Two or more tests were identified, adapted, or constructed for each factor or cell of interest in each of the models. The adaptation and construction of tests followed test-development procedures similar to those for concepts. In all, 56 tests were identified and classified according to each of the schemata.

As with the subject matter data, multiple factor analyses were performed, and the six derived solutions were interpreted using the comparable common factor strategy (Harris & Harris, 1971a).

Tests were selected for the 1971 battery on the basis of the 1970 analyses. For each of the well-identified comparable common factors at least two tests were retained, and when the results for boys and girls differed, information from both analyses was utilized. One new test, Concealed Letters, was suggested by the 1970 results.

Finally, the reduced batteries for both concept attainment and cognitive abilities were administered to about 400 children; they were volunteers who responded to a letter sent to a random sample of the population of pupils completing fifth grade in the Madison, Wisconsin, public schools.

Most of the analyses performed on the 1970 data were repeated on the 1971 data set, and, additionally, the interrelationships among subject matter concept attainment and cognitive abilities were investigated. Thus, answers to the initially posed questions were obtained.

II

Construct Validity

In this section the construct validity of the tests is discussed from two points of view: how the tests were developed and what the factorial studies of the tests indicated.

SUMMARY OF TEST DEVELOPMENT

There are three fairly well-known systems for defining cognitive abilities. One could, if he wished, accept any one of these systems and use the tests suggested by the developer of the system, or develop tests appropriate for the system adopted, as reference tests for cognitive abilities. Since the three systems are not in complete agreement with each other, and since no one of these systems is universally accepted, it was decided to use all three as guides to test development and then to study the relationships of the tests using factor-analytic procedures. It was hoped that the results of such a study would determine in a fairly clear-cut fashion distinctive reference tests for cognitive abilities.

A review and integration of early factor-analytic studies of aptitude and achievement tests is given by French (1951). Many of the factors obtained in these studies are not cognitive in nature. Those that are cognitive are well represented by the seven clear factors of the Thurstones' (1938, 1941) Primary Mental Abilities. Since 1951, Guilford (1967) has developed the Structure-of-Intellect consisting of 120 possibly distinct abilities, and Guttman (1970) has proposed a facet design consisting of nine different abilities. The work of both Guilford and Guttman depends at least in part on the work of the Thurstones. Guilford (1972) recently commented on this dependency. Guttman arrived at his facet design following reanalyses of the Thurstones' data (Guttman, 1965). The three schemata of Guilford, Guttman, and the Thurstones were used as a guide in the construction of tests, the adaptation of existing tests, and the selection of appropriate published tests. In developing tests an attempt was made to provide two or more tests for each of the Guilford Structure-of-Intellect cells of interest, for each of the cells of the Guttman design, and for each of nine Thurstone Primary Mental Abilities. For Guilford's Structure-of-Intellect, we were interested primarily in cognition as an operation, semantic as a content, and classes as a product; however, 20 different Structure-of-Intellect cells were represented in the 56-test battery. Because the three systems are alternative analyses of the same domain, a test selected in terms of one of the schemata can usually be classified readily in each of the other two schemata. These classifications are tabled and discussed in the monograph.

In working with these three schmata it became apparent that a fourth schema might be appropriate for defining abilities to cognize concepts. This schema is restricted in scope. It reanalyses the notion of content for such abilities and arrives at seven different types of content: verbal-semantic, pictorial-semantic, number-semantic, figural, number-symbolic, letter-symbolic, and word-form. It also distinguishes two types of exemplars independent of the "content" in which they are presented (things and relations), and it identifies three different tasks which each appear to be a type of cognizing (classifying, excluding, and naming). The portion of this design studied in detail included the seven contents, the two tasks of classification and exclusion, and things as exemplars. This schema is discussed in detail in the monograph and the tests are classified within it; each of the tests is categorized in the content dimension whereas only those tests which deal with cognition of concepts are categorized in the task and nature of exemplars dimensions.

A battery of 56 tests was developed to study the relationships of tests suggested by these four schemata; 35 of these were constructed by the researchers of the Concept Attainment Abilities Project specifically for use in the project. One new test, Concealed Letters, was suggested by the 1970 studies of the 56-test battery. The test development procedures discussed in general terms here apply to these 36 tests. It was mentioned earlier that for three of the tests some items were adapted from another source and that one additional test, Remote Class Completion, which is included in the packet, was constructed by Thomas F. Warren.

Test Construction: Content Validity

The first step in the test construction process was the determination of the format and type of content for the items of each particular test. For example, for Verbal Classification the content was specified as verbal-semantic and the task as one of adding an exemplar to a set of four exemplars of a class. All exemplars, both those defining the class and those offered as possible additional exemplars, were names of things rather than relationships.

When applicable, principles were enumerated by which items meeting the task and content specifications could be generated. As an example: various pathways that the letters could follow within a triangle; various sections of the alphabet; whether letters were to be adjacent as opposed to skipping one or skipping two; and the direction, forwards or backwards within the alphabet, were specified for the Letter Triangle test. When the enumeration of principles by which items could be generated was not applicable, as with Concealed Words, the advice of experts and results of small-scale tryouts were used to assist in determining appropriateness of specific items.

For all of the tests dealing with classes using semantic content (both verbal and pictorial), a sample of class names was drawn at random from a previously compiled long list of class names deemed appropriate for the fourth-grade level. A sampled class name sometimes had to be dropped and replaced by another sampled one if the exemplars of that class could not be pictured or if there were not enough appropriate exemplars of the class.

The items for the Verbal Analogies test were taken from analogy questions given by Gruber (1967). He included 14 different relations and a number of different analogies for each of these. In the revised form of the test, we used two items each for 12 different types of relations. In so doing, we felt that the antonym and synonym relations were essentially the same for our purposes and that a grammatical relation was inappropriate.

Care was taken that all items for a test be of the same type or task. For example, for the Figure Classification test, items for which all of the exemplars and the correct choice formed a series were not used. An example of this would be each succeeding exemplar, and thus the correct answer, increasing in size. Care was taken also that all of the items be of the same type of content. For example, the Number Series test was designed to contain number-semantic content in a series type format, using numbers as cardinal numbers. Items that could be answered correctly simply by form or symbolic content of the numbers were not used. An example of this is:

9 99 999 9999 _____

One could say that this item involves cardinality of the numbers--add 90, add 900, add 9000--but it can be answered correctly without conceptualizing this. If it were used, such an item would be placed in a series type test using number-symbolic content.

An attempt was made to keep reading level and other possibly confounding aspects at a minimum so that the items of the test could elicit the student behavior for which they were intended. For example, the Remembering Classes: Names test was intended to measure ability to remember inferred names for a number of classes of things. The class name first had to be inferred from the exemplars given, and then remembered. The exemplars, and hence class names, chosen for the items of this test were ones with which fifth graders were expected to be familiar.

The previous illustrations serve as examples of the kinds of things taken into consideration in the test construction process.

The items that were constructed were subjected to extensive critique during the writing process, after all had been completed, or at both stages. In particular subject-matter fields and areas of interest such as memory, the advice of experts was utilized in the development of tests. The advice and critique of reading specialists was sought regarding vocabulary used and the appropriateness of the reading level of the items. Some or all items of many of the tests were tried out on a few fifth-grade and/or other-level subjects to assist in determining appropriateness of content and/or format. All items were subjected to a final critique by the writers of this manual.

In preparing tests for use with the students, the items within a test were ordered in a random fashion in terms of difficulty. We wanted the subjects to answer every item and did not want the poorer students to expect to have items that become more difficult as they progress through a test, and thus perhaps not complete the test. However, we purposely did begin each test with one or two easy items.

Test Revision

Tryouts of the tests for item analysis and test revision purposes were conducted during the spring of 1969 and the winter and spring of 1970 with fourth- and fifth-grade students. The tryout version of each test consisted of at least 30 items. Usually half an hour was allotted to the students to respond to the items for each test. Approximately 100 students responded to each test. Most of the tests were piloted only once, although several were revised extensively following the first tryout and then were piloted again in the revised form.

The tryout data were subjected to the Generalized Item and Test Analysis Program (GITAP) (Baker, 1969), the output of which provides the proportion responding, item-criterion biserial correlation, X_{50} (point on the criterion scale corresponding to the median of the item characteristic curve), and β (the reciprocal of the standard deviation of the item characteristic curve which is a measure of the discriminating power of the item) for each possible choice for each item, as well as summary descriptive statistics for the total test. This program also gives the Hoyt reliability for the total test and the standard error of measurement.

The final version of the test usually consisted of 20 items; they were selected on the basis of both difficulty and discrimination indices obtained from the item analyses. Items with the highest discrimination indices for the correct choice were selected, since we desired the test to be highly homogeneous. However, we retained only items with X_{50}'s within the range of -2.00 to +2.00 (and, as far as possible, well representing that range), since we desired to discriminate maximally among subjects. If the β for one or more of the incorrect choices was an undesirable value when the item otherwise functioned well, those incorrect choices were revised.

SUMMARY OF COGNITIVE ABILITIES FACTORS

A summary of the comparable common factors for cognitive abilities is given in Table II.1; the order of the factors is arbitrary. The similarities across all four sets of analyses--1970 and 1971 for both boys and girls--can be seen clearly. A general observation is that the results are essentially the same for each of the analyses.

Comparable Common Factors 1 through 6 are the same for all four samples except that Numerical ability (CCF 3) did not appear for girls in 1970 and the Memory factor (CCF 5) did not appear for girls in 1971.

Table II.1

Summary of Cognitive Abilities Factors

	1970		1971	
	Boys	Girls	Boys	Girls
CCF 1	Verbal	Verbal	Verbal	Verbal
CCF 2	Induction	Induction	Induction	Induction
CCF 3	Numerical		Numerical	Numerical
CCF 4	Word Fluency	Word Fluency	Word Fluency	Word Fluency
CCF 5	Memory	Memory	Memory	
CCF 6	Perceptual Speed	Perceptual Speed	Perceptual Speed	Perceptual Speed
CCF 7	Spatial (tentative)	Spatial (tentative)	Simple Visualization	Simple Visualization
CCF 8		Evaluation (tentative)		
CCF 9		Seeing Relationships (tentative)		

In 1970, CCF 7 was tentatively identified as Spatial ability. CCF 7 was further clarified in 1971 and was named Simple Visualization; the tests on CCF 7 demand visualization of missing portions of pictures or figures. CCF 8 and CCF 9 exist only for girls in 1970; they were tentatively identified as Evaluation and Seeing Relationships. No attempt was made to further clarify these factors in 1971.

We conclude that seven latent cognitive abilities underlie the test batteries that were studied and that these are the same for both boys and girls. The seven abilities are: Verbal (comprehension of information presented in verbal- or pictorial-semantic content, including induction of classes); Induction (induction of classes when nonsemantic content is employed); Numerical (using numbers as cardinal numbers but not as nominal symbols); Word Fluency (fluency in dealing with words where word meanings are not involved); Memory (retention of memorized information); Perceptual Speed (quickness in perceiving details); and Simple Visualization (visualization of missing portions of pictures or figures). The first six are six of the seven Primary Mental Abilities of the Thurstones. The seventh is similar to the Thurstones' Closure One but we prefer to call it Simple Visualization.

In the 1970 studies, three factors were tentatively identified as: Spatial (orientation in space); Evaluation (selecting the best alternative); and Seeing Relationships (determining the type of relationship, possibly limited to nonsemantic content). No attempt was made to study these further in the 1971 studies.

It should be emphasized that the studies included tests which represented not only the Thurstone structure but also 20 cells of the Guilford Structure-of-Intellect, 9 cells of the Guttman facet design, and 14 cells of the Cognition of Concepts schema. In other words, the several schemata represented alternative hypotheses, and it was hoped that the data would provide a clear basis for a choice among these or for rejecting each of them and providing an alternative. The 20 Guilford factors might have emerged as a system, but did not. The nine Guttman factors might have emerged as a system, but did not. Our Cognition of Concepts schema might have emerged as a system, but did not. Finally, it was possible that none of these hypotheses, nor any obvious combination of them, would be supported. Instead, the derived factors reflect the Thurstone structure quite completely and consistently; we regard this as an important substantive finding.

III

Functioning of the Tests

The monograph includes extensive information about the reliability of the tests and gives norming information for both the item and the total test level for the four samples studied; these data are summarized here. This section of the manual presents information about all of the tests included in the two batteries, with emphasis on those 37 contained in the packet.

SUBJECTS

The battery of 56 cognitive abilities tests was administered during summer 1970 to 172 boys and 210 girls who had just completed the fifth grade in the public school system of Madison, Wisconsin. The battery of 31 tests was administered during summer 1971 to 204 boys and 204 girls who had just completed the fifth grade that year in the Madison system. All four sets of subjects were students who volunteered to participate as a result of a letter sent to random samples from the appropriate populations of all such boys and the appropriate populations of all such girls. Since the participation of all students identified in the random samples was impossible to attain, test score and IQ data were obtained from the files of the Madison Public School System for both the school population and the subjects of the studies. This information is tabled in the monograph; the scores for the populations and the samples were similar. In addition, data were collected from the students in the samples regarding their fathers' occupations, using the Master Occupational Code of the United States Bureau of the Census. These data are tabulated in the monograph.

Census tract data for the standard metropolitan statistical area of Madison, Wisconsin for 1970 (U. S. Bureau of the Census, 1972) gives the population for Madison as 173,258, with 168,467 of these persons being white and 2,607 or 1.5% being Negro. Some of the social characteristics of the Madison population are as follows: 7,401 persons were foreign-born with 18,443 persons native-born of foreign or mixed parentage; 23,267 were enrolled in elementary school with 20,430 of these enrolled in the public schools; 3.8% of persons 16 to 21 years of age were not high school graduates and were not enrolled in school; for persons 25 years old and over, the median school years completed was 12.8 and 75.2% were high school graduates. Characteristics of the population's labor force include the following: of 60,120 males 16 years old and over, 43,808 or 72.9% were in the labor force with

43,690 of these in the civilian labor force, of which 3.0% were unemployed; of 66,785 females 16 years old and over, 34,965 or 52.4% were in the labor force with 34,960 of these in the civilian labor force, of which 2.6% were unemployed; occupations for the 76,417 employed persons 16 years old and over were:

professional, technical, and kindred workers	20,370
managers and administrators, except farm	5,760
sales workers	5,740
clerical and kindred workers	17,118
craftsmen, foremen, and kindred workers	6,095
operatives, except transport	4,660
transport equipment operatives	1,927
laborers, except farm	2,073
farm workers	174
service workers	11,742
private household workers	758

Income characteristics of the population include: median income in 1969 of all 37,626 families was $11,385 and mean income was $12,779; 2,102 families had income of $25,000 to $49,999 and 327 families had income of $50,000 or more; 5.3% of all families had income below the poverty level and 58.0% of families had income three or more times that of the poverty level.

TEST ADMINISTRATION

For each of the studies the tests were administered by persons experienced both in test administration and in working with intermediate grade students; a ratio of one administator for approximately 30 subjects existed. For the 31-test battery of 1971, the administrators were the same for both boys and girls. In general, the students found the tests to be interesting and were motivated to do their best on each test.

Two of the tests, Identical Pictures and Perceptual Speed, were designed to be speeded tests, and were administered with the stated time limits. For all other tests students were instructed to answer every item. A suggested time limit was given for each of these tests, and if more than approximately ten percent of the students were still working at the end of the time limit, the time for the test was extended until fewer than ten percent were still working. The administrator made this judgment. If all subjects finished before the time limit was up, the test administrator went on to the next test or terminated the session. The suggested time limits were generous and were ample for every subject to complete most tests. Table III.1 gives the number of items and administration times for each test in the packet as administered in 1970. Four times are given: the range of actual time, in minutes, that was required for eight groups of girls and eight groups of boys who had just completed the fifth grade (the subjects for the

Table III.1

Number of Items and Administration Time for Each Test

Test Name	Number of Items	Administration Time in Minutes			Suggested Working Time[a]
		Range	Median-Boys	Median-Girls	
Best Word Class	20	5-10	7	6.5	10
Circle Reasoning	20	9-19	14.5	14.5	15
Class Name Selection	20	5-10	8	7.5	10
Concealed Letters[b]	40	--	--	--	15
Concealed Words	20	9-16	12	12	12
Disemvowelled Words	32	11-18	15.5	15	15
Gestalt Completion	20	9-15	11.5	12	15
Letter Classification	20	6-13	11.5	8.5	12
Letter Grouping	20	9-16	14.5	12	20
Letter Triangle	20	6-15	13	10.5	15
Number Class Extension	20	9-18	16	12	15
Number Classification	30	10-17	15	13.5	15
Number Exclusion	20	8-15	13	11	12
Number Relations	20	9-20	17	12.5	18
Number Series	20	10-13	12	12	12
Omelet	20	15-26	20	20	20
Picture Class Memory	20	4-8	5	5	7
Picture Classification	20	6-14	10	8.5	12
Picture Exclusion	20	6-13	7.5	9	15
Picture Group Name Selection	20	6-12	9.5	7.5	10
Picture Group Naming	20	7-15	10.5	8.5	15
Remembering Classes: Members	20	5-10	7.5	6.5	7
Remembering Classes: Names	20	4-8	6	5	7
Remote Class Completion	25	8-16	14.5	12	15
Same-Opposite	20	4-8	6	5	7
Scrambled Sentences	20	10-16	15	13.5	15
Seeing Trends	20	8-20	15.5	14	15
Sensitivity to Order	20	6-11	8.5	8	15
Sentence Order	40	10-15	15	12	15
Verbal Analogies	24	7-13	12	9	18
Verbal Classification	20	7-12	8	10	15
Verbal Exclusion	20	6-9	7	7	15
Word Exclusion	20	7-13	11	10	15
Word Group Naming	20	9-12	12	12	12
Word Groups	20	8-15	12	10	12
Word Linkage	20	7-12	9.5	7.5	15
Word Relations	20	7-16	13	10	15

[a] The time given is the suggested time limit used in 1971 for those tests included in the 31-test battery; for the others it is the time used in 1970.

[b] Concealed Letters was not administered in 1970.

56-test battery study) to take the test; the median time required for the boys; the median time required for the girls; and the suggested time limit used by us. Concealed Letters was not included in the 56-test battery; only the suggested time limit used in 1971 is given for it.

At the start of each new test, the administrator read the directions aloud as the students followed along in their test booklet. For some of the tests, e.g., Circle Reasoning, the example items were put on the blackboard, just as they appeared in the test directions, for ease in explaining the item type to the subjects. The subjects had an opportunity to ask any questions they might have before the test itself was begun.

RELIABILITY ESTIMATES AND NORMATIVE DATA

Table III.2 contains the means, standard deviations, Hoyt reliability estimates, and standard errors of measurement obtained for the data collected during summer 1970 using the 56-test battery. These 56 tests consisted of 35 which were constructed specifically for the CAA Project, 19 published tests used in this project for research purposes with permission from the various publishers, and two which were merely two further administrations of one of the memory tests (Remembering Classes: Members). The source of each test is given in Table III.3. The data were analyzed separately for the 172 boys and the 210 girls. Table III.2 includes the results for both of the 1970 samples and indicates the number of items composing each of the tests. The number of choices for each item of each test can also be found in Table III.3. The tests are included in Tables III.2 and III.3 in alphabetical order. The order of administration of the tests is given in Table III.4.

Table III.5 contains the means, standard deviations, Hoyt reliability estimates, and standard errors of measurement obtained for the data collected during summer 1971 using the 31-test battery. The tests are presented in Table III.5 in alphabetical order. The order of administration of these tests is given in Table III.6.

The mean scores and standard deviations are very similar for boys and girls for both years, as are the reliability estimates for 1971; the reliability estimates for 1970 are generally slightly higher for boys than for girls. The reliability estimates are in general quite good, with only 13 of the 112 estimates for 1970 below .70; 12 of the 1971 estimates are below .70. For 1970, 56 of the estimates are equal to or greater than .80, with 13 of these being equal to or greater than .90; 29 of the 1971 estimates are greater than .80, with three of these being greater than .90. Of the 13 reliability estimates below .70 for 1970, seven are for tests using pictures as semantic content, as are seven of the estimates below .70 for 1971. Perhaps it is more difficult to build reliable tests using pictures for stimulus material. The reliability estimates for one test in 1970, Verbal Analogies III, were quite low for both boys and girls. Evidently this test was too difficult for these subjects.

Table III.2

Means, Standard Deviations, Reliability Estimates, and
Standard Errors of Measurement: 1970 Boys and Girls

Test	Number of Items	Mean		Standard Deviation		Hoyt Reliability		Standard Error	
		Boys[a]	Girls[a]	Boys	Girls	Boys	Girls	Boys	Girls
1 Arithmetic Problems	35	16.58	16.59	7.19	7.40	.90	.91	2.24	2.22
2 Best Trend Name	20	10.65	10.50	4.12	3.71	.77	.70	1.93	1.97
3 Best Word Class	20	12.35	12.61	4.11	3.78	.79	.75	1.85	1.83
4 Card Rotations	112	92.02	86.38	22.34	20.84	.98	.97	3.41	3.87
5 Circle Reasoning	20	8.43	9.90	4.94	4.61	.86	.83	1.81	1.87
6 Class Name Selection	20	15.36	14.94	3.59	3.74	.80	.81	1.57	1.5[illegible]
7 Concealed Words	20	9.77	8.67	3.88	3.45	.78	.72	1.79	1.7[illegible]
8 Disemvowelled Words	32	21.66	23.45	7.82	6.42	.93	.89	2.09	2.06
9 Figure Analogies	22	15.89	16.64	5.95	4.87	.92	.88	1.64	1.65
10 Figure Classification	20	14.42	14.43	3.84	4.13	.82	.82	1.61	1.71
11 Figure Exclusion	25	20.06	20.00	2.89	2.70	.64	.59	1.69	1.68
12 Figure Matrix	20	10.95	9.36	4.63	4.11	.82	.76	1.91	1.97
13 Gestalt Completion	20	12.81	12.85	3.43	3.67	.72	.76	1.76	1.74
14 Identical Pictures	48	22.09	25.44	5.39	6.17	.88	.91	1.85	1.78
15 Letter Classification	20	12.72	13.87	4.30	3.77	.81	.78	1.81	1.73
16 Letter Grouping	20	11.52	12.50	3.95	3.48	.77	.72	1.86	1.79
17 Letter Triangle	20	14.78	15.45	3.68	3.64	.79	.81	1.66	1.56
18 Necessary Arithmetic Operations	15	10.53	10.48	3.78	3.74	.85	.84	1.42	1.42
19 Number Class Extension	20	10.40	9.72	4.74	3.98	.83	.74	1.91	1.98
20 Number Classification	30	22.75	22.44	7.24	7.31	.93	.93	1.83	1.87
21 Number Exclusion	20	11.97	12.15	4.30	3.53	.81	.71	1.85	1.86
22 Number Relations	20	11.94	10.37	5.16	4.52	.87	.81	1.81	1.91
23 Number Series	20	13.62	13.25	4.43	4.17	.85	.82	1.70	1.73
24 Omelet	20	10.87	12.21	4.44	4.21	.84	.82	1.72	1.72
25 Paragraph Comprehension	32	18.23	19.45	6.27	5.60	.84	.80	2.46	2.49
26 Perceptual Speed	40	21.76	23.06	6.32	5.44	.89	.86	2.04	2.01
27 Picture Arrangement	16	9.86	9.61	2.37	2.71	.50	.63	1.63	1.60
28 Picture Class Memory	20	15.33	15.60	2.98	3.29	.69	.76	1.63	1.56
29 Picture Classification	20	12.74	12.53	3.28	2.84	.69	.59	1.78	1.77
30 Picture Exclusion	20	12.74	12.45	2.92	2.92	.56	.57	1.89	1.86
31 Picture Group Name Selection	20	14.41	14.00	3.01	3.21	.66	.70	1.70	1.72
32 Picture Group Naming	20	12.74	12.02	3.54	3.37	.72	.67	1.84	1.88
33 Picture Meaning	30	21.85	20.74	4.28	4.66	.78	.80	1.95	2.04
34 Puzzles	30	22.09	23.41	4.39	4.24	.74	.76	2.19	2.05
35 Remembering Classes: Members	20	14.49	15.08	3.60	3.58	.75	.77	1.76	1.69
36 Remembering Classes: Members II	20	14.26	15.11	3.90	3.51	.78	.75	1.77	1.70
37 Remembering Classes: Members III	20	13.05	13.72	3.88	3.71	.77	.75	1.83	1.82
38 Remembering Classes: Names	20	16.96	18.36	3.28	2.39	.81	.79	1.39	1.08
39 Remote Class Completion	26	12.73	13.08	4.32	4.42	.77	.80	2.01	1.95
40 Same-Opposite	20	16.27	16.50	3.86	3.51	.84	.81	1.49	1.48
41 Scrambled Sentences	20	13.47	13.45	2.88	2.87	.53	.52	1.93	1.94
42 Seeing Trends	20	11.91	12.52	4.30	4.32	.80	.81	1.86	1.85
43 Sensitivity to Order	20	13.63	13.94	4.26	3.98	.84	.81	1.67	1.69
44 Sentence Order	40	32.42	34.31	8.01	7.01	.93	.93	2.07	1.85
45 Spatial Relations	25	16.70	16.75	4.58	4.31	.81	.78	1.96	1.97
46 Spelling	30	17.14	19.65	7.00	6.32	.89	.87	2.29	2.25
47 Verbal Analogies	24	14.92	14.82	4.49	4.69	.78	.81	2.04	2.00
48 Verbal Analogies III	20	6.44	6.15	2.43	2.44	.39	.43	1.85	1.80
49 Verbal Classification	20	16.13	16.53	3.34	3.02	.77	.74	1.56	1.50
50 Verbal Exclusion	20	13.42	13.80	3.23	2.61	.70	.56	1.71	1.69
51 Vocabulary	[illegible]	19.24	19.20	6.70	6.00	.89	.86	2.18	2.21
52 Word Exclusion	20	11.67	11.33	3.70	3.45	.73	.68	1.87	1.91
53 Word Group Naming	20	12.25	12.30	3.73	3.40	.75	.68	1.83	1.86
54 Word Groups	20	14.83	15.31	4.09	3.73	.82	.80	1.67	1.62
55 Word Linkage	20	11.48	11.92	4.28	4.34	.78	.79	1.94	1.92
56 Word Relations	20	12.66	13.07	5.44	5.64	.90	.91	1.67	1.63

[a] Number of subjects is 172 for boys and 210 for girls.

Table III.3

Source of Each Test and Number of Choices for Each Item[a]

Test	Source	Number of Choices
1 Arithmetic Problems		Free Response[c]
2 Best Trend Name	Sheridan Psychological Services, Inc.	3
3 Best Word Class	Constructed[b]	4
4 Card Rotations	Card Rotations Test--S-1, Part II (ETS Kit, 1962)	2
5 Circle Reasoning	Constructed	7
6 Class Name Selection	Constructed	3
7 Concealed Words	Adapted from Concealed Words Test--Cs-2 (ETS Kit, 1962)	Free Response
8 Disemvowelled Words	Constructed	5
9 Figure Analogies	Lorge-Thorndike Intelligence Tests (1964)	5
10 Figure Classification	Lorge-Thorndike Intelligence Tests (1964)	5
11 Figure Exclusion	Primary Mental Abilities Tests (1962)	4
12 Figure Matrix	Sheridan Psychological Services, Inc.	5
13 Gestalt Completion	Adapted from Gestalt Completion Test--C-1 (ETS Kit, 1962)	Free Response
14 Identical Pictures	Identical Pictures Test--P-3, Part II (ETS Kit, 1962)	5
15 Letter Classification	Constructed	3
16 Letter Grouping	Constructed	4
17 Letter Triangle	Constructed	3
18 Necessary Arithmetic Operations	NLSMA Reports (1968)	4
19 Number Class Extension	Constructed	3
20 Number Classification	Constructed	5
21 Number Exclusion	Constructed	4
22 Number Relations	Constructed	4
23 Number Series	Constructed	5
24 Omelet	Constructed	Free Response
25 Paragraph Comprehension	Iowa Tests of Basic Skills (1964)	4
26 Perceptual Speed	Primary Mental Abilities Tests (1962)	6
27 Picture Arrangement	Dorothy C. Adkins' adaptation of the Comic Strip "Louie" Adapted by and obtained from J. P. Guilford	Free Response
28 Picture Class Memory	Constructed	2
29 Picture Classification	Constructed	3
30 Picture Exclusion	Constructed	4
31 Picture Group Name Selection	Constructed	3
32 Picture Group Naming	Constructed	Free Response
33 Picture Naming	Primary Mental Abilities Tests (1962)	4
34 Puzzles	Selected items for Test of Logical Ability (Hill, 1968)	2
35 Remembering Classes: Members	Constructed	2
36 Remembering Classes: Members II	Constructed	2
37 Remembering Classes: Members III	Constructed	2

Table III.3 (continued)

Test	Source	Number of Choices
38 Remembering Classes: Names	Constructed	2
39 Remote Class Completion	Adapted from WADDLE Test (Warren & Davis, 1970)	Free Response
40 Same-Opposite	Constructed	2
41 Scrambled Sentences	Constructed	2
42 Seeing Trends	Constructed	3
43 Sensitivity to Order	Constructed	5
44 Sentence Order	Constructed	3
45 Spatial Relations	Primary Mental Abilities Tests (1962)	4
46 Spelling	Iowa Tests of Basic Skills (1964)	5
47 Verbal Analogies	Items adapted from Analogy Questions (Gruber, 1967)	4
48 Verbal Analogies III	Sheridan Psychological Services, Inc.	4
49 Verbal Classification	Constructed	3
50 Verbal Exclusion	Constructed	4
51 Vocabulary	Iowa Tests of Basic Skills (1964)	4
52 Word Exclusion	Constructed	4
53 Word Group Naming	Constructed	Free Response
54 Word Groups	Constructed	3
55 Word Linkage	Constructed	3
56 Word Relations	Constructed	5

[a] These are the 56 tests developed for the 1970 battery. Concealed Letters was constructed for the 1971 battery; it is a free response test.

[b] The tests for which the source is "Constructed" are included in the packet. The adapted Concealed Words, Gestalt Completion, and Remote Class Completion tests are also included, as is the Verbal Analogies test and the later constructed Concealed Letters test.

[c] Each item of this type of test was scored right or wrong.

Table III.4

Order of Administration of 56 Tests

1 Picture Meaning
2 Verbal Classification
3 Number Series
4 Remembering Classes: Members
5 Number Class Extension
6 Word Groups
7 Remembering Classes: Members II
8 Disemvowelled Words
9 Letter Grouping
10 Circle Reasoning
11 Figure Exclusion
12 Seeing Trends
13 Picture Classification
14 Paragraph Comprehension
15 Remembering Classes: Names
16 Word Group Naming
17 Gestalt Completion
18 Card Rotations
19 Spatial Relations
20 Verbal Exclusion
21 Best Word Class
22 Omelet
23 Picture Group Naming
24 Concealed Words
25 Perceptual Speed
26 Letter Triangle
27 Letter Classification
28 Picture Class Memory
29 Puzzles
30 Spelling
31 Picture Exclusion
32 Sensitivity to Order
33 Figure Analogies
34 Scrambled Sentences
35 Same-Opposite
36 Figure Matrix
37 Remote Class Completion
38 Number Exclusion
39 Sentence Order
40 Vocabulary
41 Word Relations
42 Verbal Analogies
43 Best Trend Name
44 Picture Arrangement
45 Arithmetic Problems
46 Identical Pictures
47 Picture Group Name Selection
48 Number Classification
49 Word Exclusion
50 Number Relations
51 Word Linkage
52 Figure Classification
53 Class Name Selection
54 Necessary Arithmetic Operations
55 Verbal Analogies III
56 Remembering Classes: Members III

Table III.5

Means, Standard Deviations, Reliability Estimates, and Standard Errors of Measurement: 1971 Boys and Girls

Test	Number of Items	Mean		Standard Deviation		Hoyt Reliability		Standard Error	
		Boys[a]	Girls[a]	Boys	Girls	Boys	Girls	Boys	Girls
1 Arithmetic Problems	35	16.78	16.95	6.56	6.06	.88	.87	2.23	2.16
2 Class Name Selection	20	15.36	15.62	3.50	2.99	.80	.72	1.53	1.55
3 Concealed Letters	40	24.20	24.20	6.03	6.39	.83	.84	2.49	2.49
4 Concealed Words	20	9.99	10.64	3.88	3.74	.77	.77	1.82	1.75
5 Figure Exclusion	25	19.64	20.06	2.96	2.70	.66	.60	1.70	1.67
6 Figure Matix	20	9.59	9.05	4.54	4.24	.81	.78	1.92	1.92
7 Gestalt Completion	20	14.34	13.74	3.01	3.47	.67	.76	1.68	1.65
8 Identical Pictures	48	23.40	25.44	7.31	7.94	.93	.95	1.86	1.83
9 Letter Classification	20	13.66	14.55	3.67	3.46	.74	.74	1.83	1.73
10 Number Class Extension	20	9.73	9.81	4.12	3.93	.76	.74	1.98	1.97
11 Number Classification	30	22.98	24.01	6.54	5.44	.91	.89	1.88	1.81
12 Number Exclusion	20	11.55	11.96	3.62	3.37	.71	.68	1.89	1.85
13 Number Relations	20	12.68	12.06	4.92	5.04	.86	.87	1.78	1.78
14 Number Series	20	12.91	13.31	4.45	4.13	.84	.82	1.75	1.72
15 Omelet	20	10.97	11.92	4.55	3.84	.85	.79	1.73	1.73
16 Perceptual Speed	35	21.52	22.88	4.27	4.70	.81	.83	1.82	1.92
17 Picture Arrangement	16	10.39	10.34	2.28	2.63	.47	.61	1.60	1.58
18 Picture Class Memory	20	15.30	15.62	3.06	3.13	.71	.74	1.61	1.55
19 Picture Classification	20	12.16	12.37	2.81	2.55	.56	.51	1.82	1.74
20 Picture Group Name Selection	20	13.87	13.40	2.72	2.84	.59	.60	1.71	1.75
21 Picture Meaning	30	21.54	20.63	4.04	4.63	.75	.79	2.00	2.06
22 Puzzles	30	22.34	23.48	4.42	3.71	.75	.69	2.17	2.04
23 Remembering Classes: Members	20	14.25	14.71	4.03	4.28	.80	.84	1.74	1.67
24 Remembering Classes: Names	20	18.08	18.76	2.81	2.27	.83	.82	1.14	.94
25 Remote Class Completion	25	13.31	14.34	4.14	4.04	.78	.76	1.91	1.92
26 Seeing Trends	20	12.48	13.29	4.24	4.06	.80	.80	1.86	1.77
27 Spatial Relations	25	17.07	15.58	4.17	4.09	.77	.74	1.96	2.05
28 Spelling	30	17.47	20.21	6.74	5.86	.88	.85	2.30	2.23
29 Vocabulary	30	19.58	20.03	6.29	5.90	.88	.86	2.18	2.14
30 Word Group Naming	20	11.75	12.42	3.70	3.34	.74	.68	1.85	1.85
31 Word Groups	20	13.57	14.73	4.18	3.97	.81	.81	1.76	1.67

[a] Number of subjects is 204 for both boys and girls.

Table III.6

Order of Administration of 31 Tests

1 Picture Meaning
2 Word Groups
3 Number Series
4 Remembering Classes: Members
5 Puzzles
6 Figure Exclusion
7 Seeing Trends
8 Picture Classification
9 Number Class Extension
10 Spelling
11 Word Group Naming
12 Concealed Words
13 Remote Class Completion
14 Perceptual Speed
15 Picture Class Memory
16 Figure Matrix
17 Number Exclusion
18 Vocabulary
19 Class Name Selection
20 Concealed Letters
21 Arithmetic Problems
22 Letter Classification
23 Picture Arrangement
24 Identical Pictures
25 Gestalt Completion
26 Omelet
27 Number Relations
28 Remembering Classes: Names
29 Picture Group Name Selection
30 Number Classification
31 Spatial Relations

These are relatively short tests and only two, Identical Pictures and Perceptual Speed, were administered in a speeded fashion. For these two speeded tests, the Hoyt reliability estimate is probably an overestimate.

ITEM INDICES

A summary by sample of the item indices obtained for each of the 56 tests of 1970 is given in Table III.7; they are given in Table III.8 for each of the 31 tests administered in 1971. The indices included are proportion correct (this is often called difficulty or P), item-criterion biserial correlation, X_{50}, and β. They are given for the correct choice only. For proportion correct and biserial correlation, the highest, lowest, and mid-value obtained over all of the items for a test is given; for X_{50} and β only the mid-value over all of the items of a test is given. For some of the tests, the highest value of X_{50} and β for an item in the test could not be computed; this is the case when the biserial correlation is 1.00 or greater. When the biserial correlation is near zero, which is the case for the lowest value for a few of the tests, the X_{50} becomes very large (absolute) and meaningless.

Table III.7

Item Indices: 1970 Boys and Girls

Test[b]	Proportion Correct[a]						Biserial Correlation[a]						X_{50}		[illegible]	
	High		Low		Mid		High		Low		Mid		Mid		Mid	
	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
1 Arithmetic Problems	94	90	03	02	47	47	91	83	33	29	66	67	.13	.12	.88	.90
2 Best Trend Name	80	78	29	28	57	50	74	68	28	24	59	53	- .32	.00	.73	.62
3 Best Word Class	88	94	26	21	67	65	78	87	10	-08	61	59	- .63	- .65	.77	.74
4 Card Rotations	93	92	62	46	82	78	114	98	37	21	80	68	-1.19	-1.16	1.35	.93
5 Circle Reasoning	69	73	18	22	42	52	92	86	25	32	72	64	.27	- .06	1.03	.84
6 Class Name Selection	94	91	34	33	81	81	103	96	-08	01	70	76	-1.21	-1.13	.99	1.18
7 Concealed Words	79	93	06	04	50	39	78	74	35	20	61	57	- .01	.41	.77	.69
8 Disemvowelled Words	95	98	37	44	69	72	101	102	45	32	78	73	- .59	- .82	1.26	1.07
9 Figure Analogies	84	91	57	58	74	78	116	115	47	47	82	77	- .72	-1.00	1.45	1.21
10 Figure Classification	93	89	04	47	75	73	102	84	-48	37	70	62	-1.01	- .79	.96	.80
11 Figure Exclusion	99	99	40	35	87	87	110	153	06	26	55	51	-1.66	-1.96	.67	.59
12 Figure Matrix	74	81	38	26	51	46	83	71	21	26	65	55	- .07	.22	.86	.65
13 Gestalt Completion	99	99	28	28	65	65	104	75	47	36	57	62	- .81	- .70	.69	.78
14 Identical Pictures	98	100	01	01	36	59	100	136	-01	09	06	94	.40	- .19	.75	2.68
15 Letter Classification	90	93	38	36	66	68	80	88	37	36	63	62	- .66	- .73	.82	.80
16 Letter Grouping	80	87	18	21	61	65	91	98	16	12	62	62	- .43	- .64	.79	.80
17 Letter Triangle	91	94	42	45	79	82	82	90	47	49	63	68	-1.15	-1.37	.81	.93
18 Necessary Arithmetic Operations	87	91	49	49	73	64	90	83	56	58	80	75	- .81	- .45	1.36	1.13
19 Number Class Extension	72	69	28	28	50	47	73	63	46	31	62	54	.01	.13	.80	.64
20 Number Classification	91	90	44	47	78	77	111	114	46	36	87	88	- .87	- .87	1.80	1.81
21 Number Exclusion	94	99	37	35	60	59	95	76	33	-01	63	58	- .43	- .45	.81	.70
22 Number Relations	75	72	37	28	60	53	88	78	48	41	68	61	- .39	- .15	.93	.76
23 Number Series	94	93	39	30	67	67	93	86	43	44	70	66	- .66	- .72	.99	.88
24 Omelet	91	91	06	13	56	66	77	83	51	46	69	65	- .23	- .60	.94	.86
25 Paragraph Comprehension	87	85	32	37	56	59	82	70	34	17	52	51	- .25	- .57	.61	.60
26 Perceptual Speed	98	100	03	03	70	76	104	95	20	-24	77	68	- .67	-1.11	1.21	.93
27 Picture Arrangement	95	92	26	20	68	65	62	78	33	40	45	54	- .91	- .87	.49	.65
28 Picture Class Memory	98	96	35	38	81	80	95	102	27	-23	69	76	-1.03	- .96	.94	1.18
29 Picture Classification	91	96	28	11	67	69	74	70	29	03	54	50	- .73	- .91	.64	.57
30 Picture Exclusion	96	96	33	22	63	64	65	66	27	34	43	43	- .78	- .72	.47	.48
31 Picture Group Name Selection	91	95	22	26	74	74	72	78	05	28	57	56	-1.20	-1.04	.69	.68
32 Picture Group Naming	98	97	36	33	58	55	74	65	07	10	54	54	- .36	- .27	.64	.61

Table III.7 (continued)

	Proportion Correct[a]						Biserial Correlation[a]						X_{50}		β	
	High		Low		Mid		High		Low		Mid		Mid		Mid	
Test[b]	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
33 Picture Meaning	99	100	10	16	77	66	88	79	14	05	61	57	-1.09	- .71	.76	.68
34 Puzzles	92	93	41	48	76	79	68	71	17	16	48	54	-1.34	-1.69	.54	.65
35 Remembering Classes: Members	90	89	42	46	75	76	89	83	24	01	58	68	-1.21	-1.15	.71	.92
36 Remembering Classes: Members II	82	90	39	50	75	75	87	82	33	06	58	61	- .94	-1.03	.72	.77
37 Remembering Classes: Members III	86	83	35	41	69	74	82	79	27	16	57	59	- .72	- .99	.70	.74
38 Remembering Classes: Names	97	98	68	74	87	93	100	126	39	53	70	82	-1.39	-1.80	.99	1.45
39 Remote Class Completion	92	94	12	05	51	45	77	70	20	22	55	61	- .05	.20	.65	.77
40 Same-Opposite	88	94	65	69	84	81	96	98	45	45	79	73	-1.22	-1.33	1.28	1.08
41 Scrambled Sentences	94	87	45	47	68	64	76	59	23	16	40	43	- .94	- .85	.43	.47
42 Seeing Trends	87	76	20	22	64	67	88	94	-08	-03	66	65	- .49	- .71	.88	.86
43 Sensitivity to Order	88	90	19	21	76	76	95	95	04	18	74	67	- .79	- .93	1.11	.90
44 Sentence Order	94	95	61	60	83	89	102	125	38	42	8[illegible]	82	-1.18	-1.36	1.35	1.64
45 Spatial Relations	90	94	20	23	71	70	83	68	35	39	57	58	- .83	- .80	.70	.87
46 Spelling	81	89	24	36	60	66	80	80	35	30	6[illegible]	63	- .37	- .67	.80	.81
47 Verbal Analogies	89	89	24	26	68	64	86	90	24	35	[illegible]8	61	- .68	- .61	.71	.77
48 Verbal Analogies III	72	73	08	08	27	28	62	64	-03	-20	39	43	1.19	1.34	.43	.48
49 Verbal Classification	95	97	70	61	82	84	126	128	42	37	64	69	-1.30	-1.46	.83	.94
50 Verbal Exclusion	98	97	05	02	71	74	117	84	18	18	57	48	-1.01	-1.13	.69	.55
51 Vocabulary	87	90	33	30	60	63	91	87	32	23	66	58	- .46	- .63	.88	.71
52 Word Exclusion	87	89	21	22	59	59	73	73	12	08	57	54	- .37	- .42	.70	.65
53 Word Group Naming	95	94	10	16	62	65	78	71	24	16	56	51	- .62	- .80	.67	.59
54 Word Groups	92	95	44	40	74	80	90	99	35	33	72	71	-1.02	-1.18	1.04	1.00
55 Word Linkage	73	76	35	35	58	61	77	74	29	38	60	59	- .49	- .46	.76	.72
56 Word Relations	78	84	26	39	64	66	88	96	51	53	80	84	- .44	- .53	1.34	1.58

[a] Decimals have been omitted.

[b] The number of choices for each item in a test can be found in Table III.3.

Table III.8

Item Indices: 1971 Boys and Girls

Test[b]	Proportion Correct[a]						Biserial Correlation[a]						X_{50}		β	
	High		Low		Mid		High		Low		Mid		Mid		Mid	
	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
1 Arithmetic Problems	95	97	01	02	52	50	87	84	35	38	61	58	- .09	.02	.76	.72
2 Class Name Selection	95	97	29	36	83	83	99	91	16	23	75	66	-1.19	-1.45	1.15	.89
3 Concealed Letters	99	99	09	13	62	60	76	131	06	13	56	55	- .70	- .44	.66	.66
4 Concealed Words	81	88	09	10	52	54	76	75	20	44	59	58	- .08	- .16	.72	.72
5 Figure Exclusion	100	100	30	40	84	93	90	90	00	00	53	57	-1.89	-2.86	.63	.69
6 Figure Matrix	76	74	30	23	45	43	85	76	34	33	60	62	.23	.33	.76	.70
7 Gestalt Completion	97	99	38	26	77	72	71	76	00	44	55	63	-1.20	- .89	.67	.81
8 Identical Pictures	95	98	04	04	44	52	136	128	13	20	83	100	.26	- .10	1.53	8.15
9 Letter Classification	89	92	46	48	66	71	82	87	20	37	55	58	- .64	-1.10	.66	.71
10 Number Class Extension	69	79	28	24	50	49	71	65	37	28	53	52	.05	.06	.62	.61
11 Number Classification	94	97	46	46	81	84	106	120	30	38	84	83	-1.00	-1.21	1.58	1.49
12 Number Exclusion	94	98	27	27	58	59	77	75	30	25	58	54	- .35	- .36	.70	.64
13 Number Relations	81	84	40	36	65	61	81	88	54	50	67	68	- .57	- .46	1.04	.93
14 Number Series	89	94	37	33	63	69	102	87	50	47	64	69	- .48	- .75	.85	.96
15 Omelet	90	95	07	07	55	65	82	79	50	49	69	62	- .18	- .57	.94	.78
16 Perceptual Speed	100	99	01	02	69	76	115	106	-12	-24	77	64	- .63	- .98	1.19	.85
17 Picture Arrangement	96	90	23	21	75	75	61	67	23	32	46	53	-1.42	-1.14	.52	.63
18 Picture Class Memory	93	95	29	35	79	83	97	100	-13	-29	71	72	-1.17	-1.15	1.01	1.03
19 Picture Classification	92	96	10	07	65	64	73	67	-12	00	48	42	- .96	- .81	.55	.46
20 Picture Group Name Selection	93	94	14	20	78	75	72	72	15	22	49	51	-1.45	-1.40	.57	.59
21 Picture Meaning	99	100	13	17	74	68	116	88	00	-04	55	57	-1.11	- .75	.66	.69
22 Puzzles	91	93	46	44	77	81	79	75	13	16	55	51	-1.31	-1.74	.65	.60
23 Remembering Classes: Members	86	86	40	40	75	78	83	88	32	41	64	71	- .91	-1.00	.83	1.02
24 Remembering Classes: Names	98	99	82	85	91	94	115	165	35	54	87	99	-1.62	-1.98	1.76	3.23
25 Remote Class Completion	93	98	14	17	64	58	81	74	33	33	60	54	- .59	- .34	.75	.63
26 Seeing Trends	89	81	23	19	65	71	78	88	05	14	66	70	- .57	- .86	.89	.97
27 Spatial Relations	93	93	24	23	74	64	81	75	31	22	57	55	- .98	- .75	.70	.66
28 Spelling	81	88	27	42	60	67	87	82	29	36	62	59	- .42	- .78	.78	.74
29 Vocabulary	91	92	30	28	67	69	95	86	18	18	64	68	- .66	- .70	.84	.92
30 Word Group Naming	96	96	16	17	57	62	86	69	31	17	54	53	- .37	- .57	.65	.62
31 Word Groups	96	97	26	37	80	76	81	88	48	43	66	68	- .78	- .93	.88	.92

---

[a] Decimals have been omitted.

[b] The number of choices for each item in a test can be found in Table III.3.

The proportion correct indicates how many subjects responded correctly to an item. The item difficulty index X_{50} gives, in standard deviation units, the criterion score at which a subject would have a 50-50 chance of getting the item correct. For example, an X_{50} value of 1.20 for an item means that subjects with a criterion score 1.20 standard deviation units *above* the mean have a 50% chance of answering that item correctly. Subjects with a criterion score higher than this have a greater chance of answering that item correctly and subjects with a criterion score lower than this, a lesser chance. Similarly, an X_{50} value of -1.20 means that subjects with a criterion score 1.20 standard deviation units *below* the mean have a 50% chance of getting that item correct; for a higher score the chance would be greater and for a lower score the chance would be less.

The two item discrimination indices, biserial correlation and β, are closely related since β is computed as a function of the biserial correlation (Baker, 1969). They are not linearly related, however. From .00 to about .30 (absolute) they are very nearly the same; beyond this, β begins to increase quite rapidly in magnitude. It may be pointed out that β is always equal to or greater (absolute) than the biserial correlation. As a general rule, .30 is often used as a lower cutting point for a desirable biserial correlation or β. For a test composed of highly homogeneous items, which is desirable for these cognitive abilities tests, the higher the discrimination indices the better.

It should be emphasized here that these item statistics are not really appropriate for the two speeded tests, Identical Pictures and Perceptual Speed. As expected, the low biserial correlations and β's were for items that appeared early in the test which were answered incorrectly by only one or two subjects; the very high ones were for items at the end of the test. The items gradually increased in difficulty in a systematic fashion.

The item indices for the 1971 data are similar to those for the corresponding test for the 1970 data. The two difficulty indices given for the items (proportion correct and X_{50}) show that the items generally were at the same difficulty level for boys as for girls; this is also indicated by the means of the total scores. The difficulty indices and mean scores indicate that these tests are appropriately difficult for these subjects, with the exception of Verbal Analogies III from the 56-test battery which seems to be too difficult. In general, many of the tests tended to be fairly easy for these subjects who had just completed the fifth grade.

Almost all of the items have desirable discrimination indices (biserial correlations and β's); this was true for approximately 95% of the items for the girls and approximately 97% of the items for the boys in 1970. The 1971 indices are similar to those obtained in 1970.

There are a few weak items in terms of item statistics remaining in some of the tests; this is readily evident from the low biserial correlation in the item indices tables. The reliability estimates for some of the tests are not as high as we would have liked. One possibility would have been to refine these tests further before publishing them. We felt this to be unnecessary, primarily for three reasons:

(a) there is rarely more than one weak item per test (in terms of having poor discrimination indices) for a particular sample; (b) a weak item does not always function poorly for both boys and girls; and (c) some of the poor items are in tests of other publishers.

IV

Description of and Ability Best Measured by Each Test

The results of our studies of the 56- and 31-test batteries indicated seven clearly distinct abilities with a possibility of three other abilities being measured by these 55 different tests. Table IV.1 includes these ten abilities with each test listed under the ability which it best measures as determined by us from our studies. The tests for an ability are listed in alphabetical order within two groups; the first group includes tests contained in the packet, *Instruments for Measuring Cognitive Abilities at the Intermediate Grade Level*, and the second group includes tests from other publishers which we included in our batteries. Capital letters for a test name denote that the test was selected by us as a reference test for that ability (the ability under which it is listed) in the 31-test battery. An A denotes that the test was a relevant variable (included on that factor for at least four of the six derived solutions) in the 1970 studies of the 56-test battery and a B denotes that the test was a relevant variable in the 1971 studies of the 31-test battery. A single A means it was a relevant variable for only one sample, either boys or girls, and double A's signify it was relevant for both samples; the same is true for the B's. Note that under Verbal ability three tests, Picture Classification, Remembering Classes: Names, and Picture Arrangement, are each marked by one or two B's but are not in capital letters. They were included in the 31-test battery to mark 1970 factors that were not readily definable. Also note that the tests listed under two of the three tentatively identified abilities, Evaluation and Seeing Relationships, are also listed under one of the seven clearly identified abilities.

A detailed discussion of the factors obtained is given in the monograph, as are the reasons for selecting the tests included in the 31-test battery. Other persons desiring reference tests for a specific ability may choose different tests than we did to mark that ability. Such decisions could be made using the factors, intercorrelations of the tests, and other more detailed information included in the monograph as bases for the decisions.

A brief description of each of the 37 tests included in the packet with an example item follows; the tests are listed in alphabetical order.

Table IV.1

Tests Categorized as Measures of Ten Abilities[a]

VERBAL	INDUCTION	NUMERICAL	WORD FLUENCY
Best Word Class AA[b] Class Name Selection AA BB[c] Picture Classification BB Picture Exclusion PICTURE GROUP NAME SELECTION AA BB Picture Group Naming Remembering Classes: Names A B REMOTE CLASS COMPLETION AA BB Same-Opposite AA Scrambled Sentences A Sensitivity to Order Sentence Order A Verbal Analogies AA Verbal Classification Verbal Exclusion WORD GROUP NAMING A BB Word Linkage AA *** Best Trend Name AA Paragraph Comprehension AA Picture Arrangement A B PICTURE MEANING AA BB PUZZLES A B Verbal Analogies III AA VOCABULARY AA BB	Circle Reasoning LETTER CLASSIFICATION AA BB Letter Grouping A Letter Triangle AA NUMBER CLASSIFICATION AA BB NUMBER EXCLUSION A BB Seeing Trends Word Exclusion AA WORD GROUPS A B Word Relations A *** Figure Analogies Figure Classification AA FIGURE EXCLUSION FIGURE MATRIX A BB	NUMBER CLASS EXTENSION AA B NUMBER RELATIONS AA B NUMBER SERIES BB *** ARITHMETIC PROBLEMS AA BB Necessary Arithmetic Operations	CONCEALED WORDS AA B Disemvowelled Words AA OMELET AA BB *** SPELLING AA BB
	MEMORY	PERCEPTUAL SPEED	SIMPLE VISUALIZATION
	PICTURE CLASS MEMORY AA B REMEMBERING CLASSES: MEMBERS AA B ***	*** IDENTICAL PICTURES AA BB PERCEPTUAL SPEED AA BB	CONCEALED LETTERS BB GESTALT COMPLETION A BB *** SPATIAL RELATIONS AA B
	SPATIAL	EVALUATION	SEEING RELATIONSHIPS
	*** Card Rotations	CLASS NAME SELECTION AA *** Figure Classification A Necessary Arithmetic Operations A	Letter Grouping A Number Series A SEEING TRENDS A *** Figure Analogies A

[a] Within an ability the tests listed in the first group are tests contained in the packet; those in the second group are tests from other publishers which we included in our batteries. Capital letters for a test name denote that the test was selected by us as a reference test for that ability in the 31-test battery; Picture Arrangement, Picture Classification, and Remembering Classes: Names were also included in the 31-test battery.

[b] Denotes that the test was a relevant variable for that ability in the study of the 56-test battery; A = one sample only, AA = both samples.

[c] Denotes that the test was a relevant variable for that ability in the study of the 31-test battery; B = one sample only, BB = both samples.

BEST WORD CLASS

This is our adaptation of Guilford's Best Word Class test. One word is given and the subject is to give the best class name.

Example: OAK is a kind of
A. plant
B. bird
C. food
D. tree

CIRCLE REASONING

This test is our adaptation of Guilford's Circle Reasoning test to make it appropriate for fifth graders. The subject is to infer a position rule for a darkened circle from four exemplars (rows of dashes and circles with one darkened circle) and to add another exemplar (darken the correct circle in a fifth row according to the rule). Guilford used 15 circles and dashes in each row of his test; we used seven.

Example:

```
● - - - 0 0 0
- ● - 0 0 0 -
0 0 0 0 0 - ●
- 0 0 - ● - -
0 0 - 0 - 0 0
1 2 3 4 5 6 7
```

CLASS NAME SELECTION

This is our adaptation of Guilford's Class Name Selection test. It is one of four included in a group to study the relationships between getting meaning from words versus getting meaning from pictures and providing a class name versus selecting a class name; the other three tests are Picture Group Name Selection, Picture Group Naming, and Word Group Naming. The same exemplars are used for many of the items in each of the four tests. Four examplars of a class are given and the subject is to infer the class and select the best class name.

Example: poodle
terrier
hound
collie
are all
A. animals
B. dogs
C. brown animals

CONCEALED LETTERS

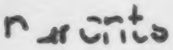
This is the new test suggested by the 1970 results. The test involves the recognition of a partially obliterated letter. The subject writes his answer. The directions stress that the letter is the <u>simplest</u> one that can be made from the parts given. This test requires hand scoring or coding.

Example:

____

CONCEALED WORDS

This is our adaptation of Thurstone's Mutilated Words test. Portions of our test were taken from the Concealed Words Test--Cs-2 in the ETS Kit of Reference Tests for Cognitive Factors (1962). The test involves the recognition and writing down of a partially obliterated word. The words used are all very familiar ones. This test requires hand scoring or coding.

Example:  ________________

DISEMVOWELLED WORDS

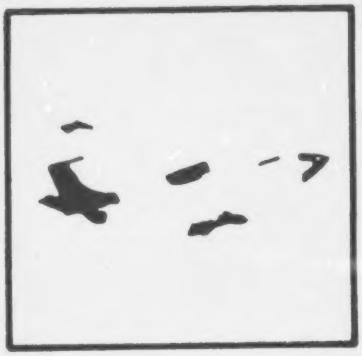
This test is our adaptation of Guilford's Disemvoweled Words test. Words with blanks where vowels normally appear in the spelling of the word are given. The subject is asked to give the vowel which belongs in the blank.

Example: Y _ S T _ R D _ Y
1 2 3

GESTALT COMPLETION

This is our adaptation of the Thurstone-Street Gestalt Completion test, which has also been used by Guilford. Portions of our test were taken from the Gestalt Completion Test--C-1 in the ETS Kit of Reference Tests for Cognitive Factors (1962). The test involves naming an object from a partially obliterated picture of it. This test must be hand scored or coded as the subject produces the answer.

Example:



____

LETTER CLASSIFICATION

This test was constructed to measure the ability represented by the "classification of things with letter-symbolic content" cell in the Cognition of Concepts schema. It was patterned after the Letter Grouping test which is an exclusion type task for things with letter-symbolic content. The subject is to infer a class from three given exemplars and add, from three choices, a fourth exemplar to that class.

Example: AAA 1. ABC
CCC 2. DDD
BBB 3. AAB

LETTER GROUPING

This test is our adaptation of Guilford's Letter Grouping test. The test was originated by L. L. Thurstone. The subject is given four groups of three or four letters each. He is to infer a class and then choose the group which is different (does not belong to the class). This is an exclusion technique, selecting the nonexemplar, as opposed to a classification one of adding another exemplar.

Example: 1. AAA 2. BBB 3. CCC 4. ABC

LETTER TRIANGLE

This is our adaptation of Guilford's Letter Triangle test. Letters as members of the alphabet with ordinal position are presented in the form of a triangle with a blank appearing where one of the letters belongs. The subject is to find a spatial rule for the ordering of the letters and select, from three choices, the letter that belongs in the blank. Guilford used 15 letters and blanks in a five-row triangle in his test; we used five letters and one blank in a three-row triangle.

Example: _ 1. O
P L 2. N
F H J 3. M

NUMBER CLASS EXTENSION

This test was constructed to fill the "classification of things using number-semantic content" cell of the Cognition of Concepts schema. The test calls for inferring a class from four given numbers and selecting another exemplar of that class from three given choices.

Example: 3 A. 2
9 B. 6
12 C. 13
21

NUMBER CLASSIFICATION

This is our adaptation of Guilford's Number Classification test. Numbers are used as symbols. The subject is to infer a class, according to the form or structure of the numbers, from three exemplars and select another exemplar of that class. We used the same format as Guilford, short matching sets, with the modification of only three items and five choices in a set instead of four items and five choices.

Example:	I.	21	24	27	A. 39
					B. 44
	II.	79	89	19	C. 12
	III.	22	33	55	D. 92
					E. 23

NUMBER EXCLUSION

This test was constructed to parallel the Number Classification test but to require the task of exclusion instead of classification--it belongs in the "exclusion of things with number-symbolic content" cell in the Cognition of Concepts schema. Four exemplars, using numbers as symbols, are given. The subject is to infer a class and select the one exemplar that is incorrect for that class.

Example: A. 22 B. 55 C. 26 D. 33

NUMBER RELATIONS

This is our adaptation of Guilford's Number Relations test. Four exemplars which are pairs of numbers are given. The subject is to infer a quantitative rule for the relationship of the number pairs and select the exemplar which does not follow this rule.

Example:
A. 3, 4
B. 1, 2
C. 4, 6
D. 2, 3

NUMBER SERIES

This is a typical number series test in which exemplars forming a series are given and the subject must infer a quantitative rule and choose the number which would come next in the series from five choices which are given. The rule is based on addition, subtraction, multiplication, division, powers, roots, etc. It may be noted here that we experimented with the type where any one number in the series may be incorrect and the task is to find this one incorrect number. It was found that this type of number series item was too difficult for fifth graders.

Example: 7 8 9 10 ___

A. 7
B. 8
C. 10
D. 11
E. 12

OMELET

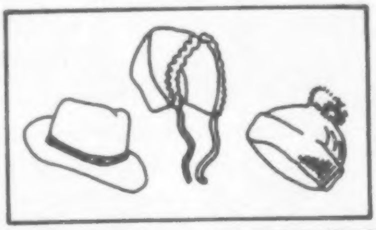
This is our adaptation of Guilford's Omelet test. It is an anagrams test. Familiar words are given with the letters in a scrambled order and the subject is to write the word spelled correctly. This test requires hand coding or scoring.

Example: orf ____________________

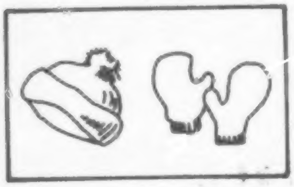
PICTURE CLASS MEMORY

This is our adaptation of Guilford's Picture Class Memory test. The subject studies ten sets of three pictures each. The three pictures in each set are exemplars of a class. The subject infers the class, remembers it, and then judges whether or not 20 sets of two pictures each belong to a class that was studied. Each of the sets of two pictures to which the subject responds contains one picture from one of the sets which was studied. This was an attempt to make the test measure remembering of a class more than remembering specific exemplars of a class, which we felt might be more like remembering units (to use Guilford's terms).

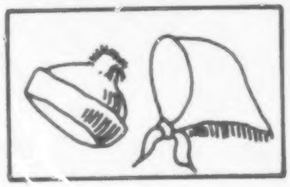
Example:



I.



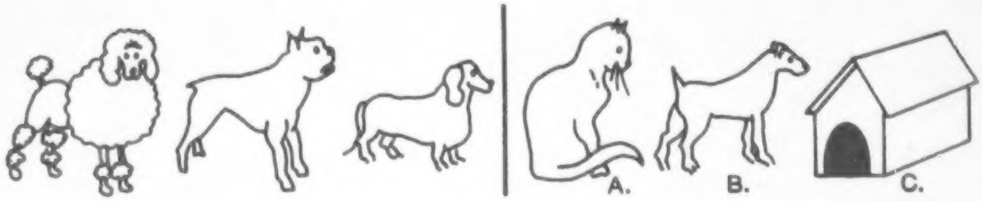
II.



PICTURE CLASSIFICATION

This test was constructed to parallel the Verbal Classification test using picture-semantic content instead of verbal-semantic; the purpose was to study the relationships of getting meaning from pictures and from words. Many of the items use the same exemplars as those used in the Picture Exclusion test to study the relationships between classification and exclusion type tasks without the confounding effects of specific content (exemplars). Pictures of three things which belong to a class are given. The subject is to infer the class and choose a fourth exemplar of that class.

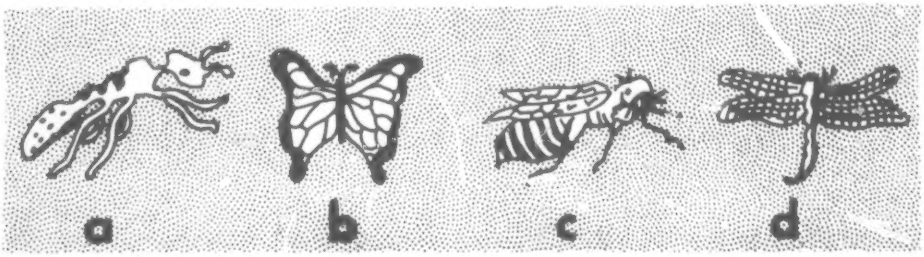
Example:



PICTURE EXCLUSION

This test was constructed to parallel the Verbal Exclusion test using picture-semantic content instead of verbal-semantic content to study the relationships between getting meaning from pictures and getting meaning from words. As was discussed earlier, many of the items of this test use the same exemplars as those used in the Picture Classification test in order to study the relationships between the two tasks of classification and exclusion. Pictures of four things are given. Three of these belong to a class. The subject is to infer the class and choose the pictured object which does not belong to that class.

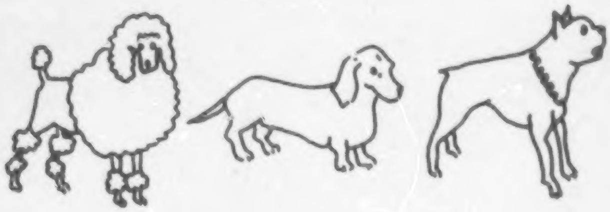
Example:



PICTURE GROUP NAME SELECTION

This test was constructed to complete the picture versus word and naming versus name selection group of tests in order to study these relationships. As previously mentioned, the other three tests are Word Group Naming, Picture Group Naming, and Class Name Selection. Three pictured exemplars of a class are given. The subject is to infer the class and select the best name for the class.

Example:



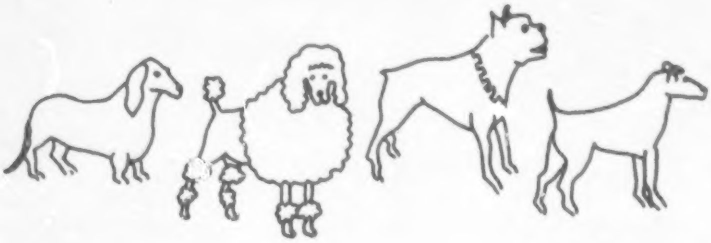
are all:

A. animals
B. brown animals
C. dogs

PICTURE GROUP NAMING

This is our adaptation of Guilford's Picture-Group Naming test. Four exemplars of a class are given in the form of pictures. The subject is to infer the class and supply a name for it. This is a free response type test and requires hand scoring or coding. As was pointed out before, the exemplars given for many of the items are the same ones as those used for three other tests.

Example:



are all:

____

REMEMBERING CLASSES: MEMBERS

This test was suggested by Guilford's Remembering Classes test. His test calls for inferring and remembering class names. (Our test of this type is called Remembering Classes: Names.) For this test the subject studies 10 sets of three words. Immediately following the study period, he is asked to respond whether or not each of 20 sets of two words belongs to a class that was studied. Each set of two words contains one word from a studied set of three words. This was an attempt to make the task more a memory for classes than a memory for specific things studied. It was felt that this type of test may be a "remembering classes" test more than one which calls for inferring and then remembering a class name; the latter type may be more dependent on being able to name the class.

Example: chair
desk
bed

A. chair
sofa

B. chair
door

REMEMBERING CLASSES: NAMES

This test is our adaptation of Guilford's Remembering Classes test. The subject infers a class name for 10 sets of four words each and is to remember these class names. He is tested by being asked to recognize the 10 class names from among 10 other class names.

Example: dog
cat
horse
rabbit

1. animals
2. plants

REMOTE CLASS COMPLETION

This test consists of selected items from the "WADDLE" test (Warren & Davis, 1970). They were used with the permission of the developers. Three words are given and the subject is to produce a fourth word that goes with all three of the given words. The words all belong together in some way, but the class is a remote one. This test requires hand coding or scoring.

Example: right fist shake __________

SAME-OPPOSITE

Two words are given for each item. The subject is to decide whether the two words are the same or about the same in meaning or are opposite or about opposite in meaning.

Example: big . . . large

SCRAMBLED SENTENCES

This test consists of short simple sentences (4 to 11 words) that are presented in a scrambled order. The subject is to rearrange the words to form a sentence and then decide whether the statement of the rearranged sentence is true or false. To make it more of a school learning achievement type of test, the content of the sentences was taken from the four subject-matter fields being studied by the CAA Project: language arts, mathematics, science, and social studies.

Example: above grow ground flowers

(When these words are correctly rearranged, do they make a true or false statement?)

SEEING TRENDS

This test is our adaptation of Guilford's Seeing Trends II test. The content of the test is word-form; words are used as collections of letters. Four exemplars are given. The subject infers a rule based on number of letters, alphabetic position of letters, etc., and places another exemplar in its proper serial position.

Example: six _____ five _____ fifty _____ one (nine)
A B C

SENSITIVITY TO ORDER

This is our adaptation of Guilford's Sensitivity to Order test. Four exemplars are given in their correct order with a fifth that is to be fit into this order in one of five places according to its proper serial position. Guilford gave five exemplars and asked that the order be rearranged if it was incorrect.

Example:

_____Monday_____Wednesday_____Thursday_____Friday_____(Tuesday)
A B C D E

SENTENCE ORDER

This is our adaptation of Guilford's Sentence Order test. Three short and simple sentences which are in a random temporal order are given. The subject is to infer the proper order of events, arrange the three sentences in this order, and tell which sentence should come first and which sentence should come last.

Example:
1. Which sentence below should come first?
2. Which sentence below should come last?

A. I bought some apples.
B. Mother sent me to the store.
C. I ate an apple on the way home.

VERBAL ANALOGIES

This test consists of 24 items adapted from Analogy Questions (Gruber, 1967) with the permission of the publisher, Arco Publishing Company, Inc. Questions for 14 different types of relationships are included in the book; we used two items for each of 12 different types of relationships in the test. The types of relationships used were: action to object, association, antonym, cause and effect, characteristic, degree, object to action, part-part, part-whole, place, purpose, and sequence. We did not use grammatical and synonym types.

Example: HAND is to MAN as PAW is to

A. boy
B. dog
C. foot
D. bird

VERBAL CLASSIFICATION

This test is our adaptation of Guilford's Verbal Classification test (which was adapted from Thurstone). We simplified the format for use with fifth graders and made it machine scorable. The subject is given four exemplars which belong to the same class. He is to infer the class and then choose, from three choices, another exemplar of that class.

Example:

steak
milk
orange
onion

A. egg
B. knife
C. dish

VERBAL EXCLUSION

This is our adaptation of Guilford's Word Classification test. From four given words, three of which are exemplars of a class and one a nonexemplar, the subject infers a class and picks out the nonexemplar.

Example: A. Sunday B. Thursday C. Yesterday D. Wednesday

WORD EXCLUSION

This test was constructed to measure the ability implied by the "exclusion of things of word-form content" cell in the Cognition of Concepts schema. From four words as collections of letters the subject is to infer a class rule and select the nonexemplar of the class.

Example: A. thought B. tot C. that D. twirl

WORD GROUP NAMING

This test is our adaptation of Guilford's Word-Group Naming test. Four exemplars of a class are given and the subject must supply a name for the class. This is a free response type of test and requires hand scoring or coding. It should be pointed out here that the exemplars given for many of the items of this test are the same ones as those given for many of the items of three other tests--Picture Group Naming, Picture Group Name Selection, and Class Name Selection. The purpose of this was to study the relationships between producing and selecting a class name when the exemplars are given in verbal-semantic and picture-semantic content; the exemplars were held constant so knowledge of specific things would be kept to a minimum as a confounding influence.

Example: poodle
terrier are all ____________________
hound
collie

WORD GROUPS

This test is our adaptation of Guilford's Word Groups. We changed the format to make it machine scorable. The subject is given four words, using words as collections of letters or forms, and is asked to add an exemplar to that class from three given choices.

Example: ran A. fat
man B. fan
can C. cat
tan

WORD LINKAGE

This is our adaptation of Guilford's Word Linkage test. Word pairs, with both words having a common double meaning are given. The subject is to select the common double meaning, i.e., a word that is related to both of the given words.

Example: airplane--insect A. fly
B. passenger
C. bug

WORD RELATIONS

This is our adaptation of Guilford's Word Relations test. It is a multiple-choice analogies test with two pairs of words presented to determine the relationship instead of only one. The subject is to infer the rule and complete a third pair by choosing the answer from five possible choices.

Example: top - pot A. pet
B. tat
tip - pit C. part
D. put
tap - ___ E. pat

V

Scoring Keys

The keys for scoring the machine-scorable tests in the packet are given on the following page. The 30 machine-scorable tests are:

- Best Word Class
- Circle Reasoning
- Class Name Selection
- Disemvowelled Words
- Letter Classification
- Letter Grouping
- Letter Triangle
- Number Class Extension
- Number Classification
- Number Exclusion
- Number Relations
- Number Series
- Picture Class Memory
- Picture Classification
- Picture Exclusion
- Picture Group Name Selection
- Remembering Classes: Members
- Remembering Classes: Names
- Same-Opposite
- Scrambled Sentences
- Seeing Trends
- Sensitivity to Order
- Sentence Order
- Verbal Analogies
- Verbal Classification
- Verbal Exclusion
- Word Exclusion
- Word Groups
- Word Linkage
- Word Relations

The keys for the tests that need to be hand-scored or hand-coded follow on pages 47 through 55. The 7 hand-scored tests are:

- Concealed Letters
- Concealed Words
- Gestalt Completion
- Omelet
- Picture Group Naming
- Remote Class Completion
- Word Group Naming

Keys for Machine-Scorable Tests

Test Name	Item Number																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Best Word Class	A	B	D	C	A	B	A	B	C	C	B	B	A	B	A	A	D	C	D	D
Circle Reasoning	2	3	5	5	7	6	6	3	5	6	5	6	5	5	7	5	7	7	5	7
Class Name Selection	B	A	A	B	C	C	A	B	A	C	B	C	A	A	C	C	B	A	B	C
Disemvowelled Words[a] [b]	1	2	1	4	2	1	2	3	4	3	2	1	2	1	3	4	2	4	2	2
	4	2	1	3	4	5	2	1	1	2	4	5								
Letter Classification	2	1	3	1	2	2	3	1	2	1	3	1	2	1	3	2	3	1	3	3
Letter Grouping	2	3	1	4	2	1	2	3	1	4	3	1	2	4	3	2	2	4	2	1
Letter Triangle	1	2	3	3	1	3	3	2	1	2	1	1	2	3	3	1	1	3	3	2
Number Class Extension	A	C	C	B	A	B	A	C	C	B	A	C	B	C	A	B	A	C	B	B
Number Classification[a]	E	A	C	D	A	B	E	A	C	C	A	E	E	A	B	D	A	B	E	B
	C	D	B	A	A	C	E	E	B	C										
Number Exclusion	B	D	B	C	A	C	B	B	C	A	D	B	A	B	A	D	D	B	C	D
Number Relations	A	B	D	B	C	C	B	C	B	D	A	A	A	C	B	A	D	C	A	A
Number Series	D	C	C	D	A	B	A	E	C	E	C	B	C	C	B	D	E	E	A	E
Picture Class Memory	T	F	F	T	T	T	F	T	T	F	F	T	F	F	T	F	T	T	F	T
Picture Classification	B	A	C	B	C	A	B	C	C	A	A	A	B	B	B	A	C	A	C	B
Picture Exclusion	D	C	A	B	D	B	D	D	B	C	A	C	A	B	D	C	A	B	A	C
Picture Group Name Selection	B	A	B	B	C	C	C	A	B	C	B	A	A	C	B	C	A	B	B	A
Remembering Classes: Members	T	T	F	T	T	T	F	F	T	T	F	T	F	F	F	F	T	F	F	F
Remembering Classes: Names	F	T	T	F	T	T	F	F	T	F	T	T	F	F	F	T	T	F	T	F
Same-Opposite	T	F	T	F	F	F	T	F	F	T	T	F	T	T	F	T	F	F	T	F
Scrambled Sentences	F	T	F	F	T	T	T	F	F	T	F	T	F	F	T	F	T	T	T	F
Seeing Trends	B	B	A	B	A	C	A	A	C	A	A	A	A	B	C	C	B	C	B	A
Sensitivity to Order	C	E	C	B	D	A	D	C	A	C	D	B	D	B	B	C	A	E	B	C
Sentence Order[a]	C	A	B	A	B	C	C	A	B	A	A	B	C	A	B	C	C	A	B	C
	B	A	A	B	C	A	B	A	C	A	A	B	B	C	C	B	A	B	B	C
Verbal Analogies[a]	A	A	C	A	B	B	D	A	B	B	C	D	D	D	B	A	C	D	B	C
	D	A	C	C																
Verbal Classification	C	B	B	A	C	B	C	C	A	C	C	B	A	C	B	A	A	C	B	B
Verbal Exclusion	D	A	C	B	A	A	D	B	C	D	C	B	C	D	A	B	D	B	A	A
Word Exclusion	B	D	B	C	D	A	B	B	D	C	A	A	C	C	D	B	A	D	B	A
Word Groups	B	C	A	A	C	B	A	C	B	A	A	C	B	C	A	B	C	A	C	B
Word Linkage	C	C	A	A	B	B	A	B	A	B	C	A	A	A	B	C	B	C	A	C
Word Relations	B	A	E	A	B	D	E	C	A	C	D	E	D	B	D	E	C	C	A	B

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[a] The second row contains the answers for items beginning with number 21.

[b] Subsequent to the study, we discovered satisfactory alternative answers: number 14 can be either 1 or 5 and number 28 can be either 1 or 4.

CONCEALED LETTERS

Key for Scoring

1. g
2. m
3. w
4. u
5. y
6. x
7. f
8. h
9. k
10. m
11. v
12. d
13. f
14. o
15. t
16. z
17. x
18. p
19. u
20. n
21. g
22. b
23. y
24. q
25. u
26. t
27. f
28. e
29. c
30. e
31. g
32. x
33. r
34. l
35. h
36. z
37. v
38. n
39. t
40. q

CONCEALED WORDS

Key for Scoring

1. dog
2. shoe
3. four
4. answer
5. about
6. picture
7. money
8. pool
9. reading
10. people
11. start
12. smell
13. ship
14. other
15. needs
16. early
17. weight
18. think
19. mother
20. help

GESTALT COMPLETION

Key for Scoring

1. hand
2. witch on broom
3. wagon
4. monkey
5. shoe
6. elephant
7. chicken
8. man and woman
9. fire
10. steam shovel
11. pipe
12. ice skate
13. bird
14. ship
15. archer (man with bow)
16. top
17. person (woman) in chair
18. coffee pot
19. flag
20. giraffe

OMELET

Key for Scoring

1. rack
2. gift
3. boil
4. king
5. milk
6. ugly
7. onion
8. skunk
9. extra
10. class
11. silk
12. risen, resin, rinse, siren, reins
13. rich
14. oven
15. juice
16. agree, eager
17. after
18. mayor
19. mask
20. frisk

PICTURE GROUP NAMING

Key for Scoring

	Acceptable responses	Non-acceptable responses
1.	yard tools garden tools	equipment gardening tools
2.	homes shelters	animal homes
3.	cutters cutting tools	tools sharp
4.	measuring instruments measurers	instruments measures
5.	parts of face parts of head	senses parts of body organs
6.	birds	
7.	feet	
8.	make-believe characters pretend fairy-tale people	historical fairies fairy tales people
9.	flying things aircraft air transportation	transportation
10.	organs body organs human organs	parts of body

NOTE: Only the answers given under "acceptable responses" are to be counted as correct (or other forms of the same words: e.g., "drinking things" instead of "things to drink from"). The "non-acceptable responses" column is to caution you against some common incorrect responses.

PICTURE GROUP NAMING (continued)

	Acceptable responses	Non-acceptable responses
11.	warm clothing protective clothing	warm clothes overclothes
12.	transportation motor vehicles ways to ride	automobiles
13.	sweets desserts	
14.	means of communication news information	entertainment
15.	forms of water	weather
16.	containers holders	
17.	parts of tree	
18.	fasteners holders	
19.	sports equipment	sports
20.	insects	bug animals

REMOTE CLASS COMPLETION

Key for Scoring

1. baby
2. sleep
3. door
4. bread
5. dream
6. queen, king
7. cold
8. lion
9. fingers
10. feet
11. stomach
12. whistle
13. auto, car
14. cheese
15. mountain
16. shoe
17. head
18. numbers
19. house
20. soldier
21. eagle
22. earth
23. street
24. salt
25. square

NOTE: Any part of speech of the correct answer should be scored as correct.

WORD GROUP NAMING

Key for Scoring

	Acceptable responses	Non-acceptable responses
1.	insects	bugs animals
2.	drinking drinking utensils things to drink from	bottles silverware tableware
3.	sports equipment	sports
4.	fasteners	
5.	parts of tree	
6.	containers	
7.	babies baby animals young	
8.	make-believe pretend	historical
9.	aircraft flying things	
10.	gardening tools	
11.	homes	animal homes
12.	cutters cutting tools	tools sharp

NOTE: Only the answers given under "acceptable responses" are to be counted as correct (or other forms of the same words: e.g., "drinking things" instead of "things to drink from"). The "non-acceptable responses" column is to caution you against some common incorrect responses.

WORD GROUP NAMING (continued)

	Acceptable responses	Non-acceptable responses
13.	measuring instruments	
14.	parts of face parts of head	senses parts of body
15.	forms of water	weather
16.	communication	entertainment
17.	domestic animals farm animals	animals
18.	sweets candies	
19.	birds	
20.	feet	

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